

Attachment 2 to Section J

ERA Requirements Document (RD)

Table of Contents

1.0	INTRODUCTION.....	1
1.1	SYSTEM PURPOSE.....	1
1.2	DOCUMENT ASSUMPTIONS.....	1
1.3	SYSTEM SCOPE.....	2
1.4	ACRONYMS AND DEFINITIONS	2
1.5	REFERENCES	3
1.5.1	NARA and ERA PMO Documents	3
1.5.2	Standards and Guidelines.....	4
1.6	OVERVIEW	4
2.0	GENERAL SYSTEM DESCRIPTION.....	5
2.1	SYSTEM CONTEXT.....	5
2.1.1	External Interfaces	6
2.2	MAJOR SYSTEM CAPABILITIES	8
2.3	SYSTEM CONSTRAINTS AND CONDITIONS	9
2.3.1	Constraints	9
2.3.2	Constraints related to Compliance with Law, Executive Orders, NARA and Federal Regulations, and Other NARA and Federal Policies, Guidance, and Plans.....	11
2.3.3	Conditions.....	12
2.4	USER CHARACTERISTICS.....	12
2.5	CONCEPTS AND ASSUMPTIONS	13
2.6	ERA CAPABILITIES BY USER CLASS	14
2.7	REQUIREMENTS CATEGORIZATION.....	14
2.7.1	Records Management (referred to as “Data Management” in the OAIS model).....	14
2.7.2	Preservation (referred to as “Preservation Planning” in the OAIS model).....	16
2.7.3	Archival Storage.....	18
2.7.4	Security.....	19
2.7.5	Ingest	19
2.7.6	Access	19
2.7.7	User Interface	20
2.7.8	Administration	21
2.7.9	System Characteristics.....	21
3.0	REQUIREMENTS LIST.....	22
	RECORDS MANAGEMENT	22
	PRESERVATION	31
	ARCHIVAL STORAGE	36
	SECURITY	37
	INGEST	40
	ACCESS	41
	USER INTERFACE.....	47
	ADMINISTRATION	48
	SYSTEM CHARACTERISTICS	53
	APPENDIX A: GLOSSARY OF TERMS.....	A-1
	APPENDIX B: REQUIREMENTS TABLES	B-1

List of Tables

Table 1-1: Acronym List.....	3
Table 2-1: Producer Data Flows	7
Table 2-2: Financial Systems Data Flows	7
Table 2-3: Space/Inventory Management Data Flows.....	7
Table 2-4: Consumer Data Flows	8
Table 2-5: Administrative Data Flows.....	8
Table B-1: ERA Availability Requirements	B-1
Table B-2: ERA Record Volume Requirements.....	B-2
Table B-3: ERA System Performance Requirements	B-3

List of Figures

Figure 2-1: External Interfaces Context Diagram.....	6
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ERA Requirements Document (RD)

1.0 Introduction

This Requirements Document (RD) defines the requirements for the National Archives and Records Administration's (NARA's) Electronic Records Archives (ERA) solution. The requirements in this RD will be further decomposed during system analysis and design.

1.1 System Purpose

NARA ensures, for the citizen and all branches of the Government, ready access to essential evidence that documents the rights of citizens, the actions of Federal officials, and the national experience. The purpose of the ERA system is to enable NARA to realize its strategic vision: "ERA will authentically preserve and provide access to any kind of electronic record, free from dependence on any specific hardware or software, enabling NARA to carry out its mission into the future."

Increasingly, this "essential evidence" takes the form of electronic records. Traditional methods of transfer, preservation, and access are not applicable to electronic records. Electronic records pose unique archival difficulties, including ease of deletion and the risk that advancing technology will render records and operating systems obsolete in a short period of time, making the records inaccessible. Compounding the problem is the diversity, complexity, and enormous volume of electronic records being generated, and the rapidly changing nature of the systems that are used to create them.

The ERA solution must be dynamic (capable of responding to continuing change) and sound, ensuring that electronic records delivered to future generations of Americans are authentic decades in the future, as they were when first created. Developing an appropriate set of requirements at the beginning of the system lifecycle is essential to a successful outcome.

1.2 Document Assumptions

The following assumptions were made during the development of this document.

- Readers of this document are expected to have a basic knowledge of archival concepts. This knowledge will be necessary for the reader to understand the subject matter covered herein. Documents listed in **Section 1.5, References**, of this RD can provide information helpful in understanding the ERA project and the contents of this document.
- **Sections 1.0 and 2.0** of this RD are provided as background and context information only. The actual requirements for ERA are listed in **Section 3.0** and the tables referenced by **Section 3.0**.

- This RD is not intended as a System Requirements Specification (SyRS). It states the high-level requirements for ERA that will be further decomposed into an SyRS. IEEE standard 1233-1998 was used to provide guidance to help ensure that the requirements were well-formed.

1.3 System Scope

The scope of ERA includes both electronic and non-electronic records. In the requirements, where the term “electronic records” is used, it refers to only electronic records, whereas when the term “records” (without the adjective) is used, it refers to all records, both non-electronic and electronic. Furthermore, when the term “assets” is used it refers to any information that is available within the ERA system (records, descriptions, template data, records lifecycle data, etc.). The following statements help to define ERA’s scope.

- ERA will coordinate lifecycle management transactions (such as appraisal, disposition agreements, transfers, accessions) for all records.
- ERA will be capable of creating, storing, and searching descriptions for all records.
- ERA will process and store electronic records.
- ERA will not track non-electronic records archival processing or location; e.g., movement of boxes, shelving, re-filing.
- ERA will interface with other systems (see **Figure 2-1**) to provide them with relevant lifecycle management information.
- ERA will not provide the capability to convert non-electronic records to electronic format.
- ERA will be able to ingest the results of a conversion of non-electronic records to electronic format.
- ERA will ensure that electronic records transferred to NARA remain free from corruption and accessible regardless of changes in information technology.
- ERA will dispose of electronic records as stipulated by a disposition agreement.
- ERA will enforce restrictions on access and release of electronic records.
- ERA will store electronic records that are unclassified, sensitive, and classified through Top Secret/Sensitive Compartmented Information (SCI)

1.4 Acronyms and Definitions

Table 1-1, Acronym List, contains a list of acronyms relevant to this document.

Acronym	Definition
BER	Bit Error Rate
CFR	Code of Federal Regulations
CMM	Capability Maturity Model

Acronym	Definition
ConOps	Concept of Operations
COTS	Commercial Off The Shelf
DoD	Department of Defense
EDAC	Error Detection and Correction
ERA	Electronic Records Archives
FEA	
FISMA	Federal Information Security Management Act of 2002
FOC	Final Operating Capability
FOIA	Freedom of Information Act
GRS	General Records Schedule
IEEE	Institute of Electrical and Electronic Engineers
IOC	Initial Operating Capability
IPT	Integrated Product Team
IRD	Internal Interface Requirements Document
MNS	Mission Needs Statement
MTTF	Mean Time to Failure
MTTR	Mean Time to Repair
NARA	National Archives and Records Administration
OAIS	Open Archival Information System
PB	Petabyte
PMO	Program Management Office
POST	Program Office Support Team
RD	Requirements Document
RQG	Requirements Management Guidance
RQM	Requirements Management Plan
SCI	Sensitive Compartmented Information
SEI	Software Engineering Institute
SME	Subject Matter Expert
SyRS	System Requirements Specification
TBD	To Be Determined
VS	Vision Statement

Table 1-1: Acronym List

1.5 References

The standards, guidelines, and documentation used to develop the RD are described in the sections that follow.

1.5.1 NARA and ERA PMO Documents

The following NARA and ERA Program Management Office (PMO) documentation was used to support the generation of this document.

- ERA Concept of Operations (ConOps), Version 3.0
- ERA Vision Statement (VS), Version 1.0
- ERA Mission Needs Statement (MNS), Version 1.2
- ERA Requirements Management Guidance (RQG), Version 1.0
- ERA Requirements Management Plan (RQM), Version 2.1
- NARA Enterprise Architecture, Version 2.0
- Lifecycle Data Requirements Guide, Second Edition

1.5.2 Standards and Guidelines

The standards and guidelines used in preparation of this document are listed below.

- The Strategic Plan of the National Archives and Records Administration 1997-2008 (Revised 2003)
- Open Archival Information System (OAIS), CCSDS 650.0-R-2
- IEEE Std 1233 - 1998, IEEE Guide for Developing System Requirements Specifications
- IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications
- Software Engineering Institute (SEI) Software Acquisition Capability Maturity Model (CMM), Version 1.02
- Federal Enterprise Architecture (FEA)

1.6 Overview

The RD was compiled from information gathered by two (2) Requirements Integrated Product Teams (IPTs) (each of which created preliminary versions of this document), the *ERA Concept of Operations (ConOps)* Document, an ERA PMO Use Case Analysis project, interviews with key NARA Subject Matter Experts (SMEs), interviews with users external to NARA, and concept papers written by members of the ERA PMO and ERA Program Office Support Team (POST). Requirements were defined and decomposed from those sources to create functional, performance, non-functional, behavioral, and informational requirements. The requirements were then further refined and categorized based on the Open Archival Information System (OAIS) model. Due to the wide range of sources for the requirements elicitation for this project, there is no way to directly link each requirement to its particular source. Requirements from these sources were combined, refined, and decomposed, and therefore, these requirements are an amalgamation of the work of the sources listed above.

Guidance utilized for the development of requirements is contained in the *ERA Requirements Management Plan (RQM)* document.

2.0 General System Description

ERA will be an agency-wide system capable of supporting NARA's lifecycle management process for records of the U.S. Government and for donated historical materials. It will support automating the execution of these lifecycle management processes, and of ingesting, preserving, and outputting the electronic records that NARA receives.

The system concept is described more extensively in the *ERA ConOps* document.

2.1 System Context

The ERA system will support NARA's lifecycle management of records of the President, the Congress, the Supreme Court, other Federal courts, and agencies of the U.S. Government. In addition, the system will be used for records accepted by NARA under a deed of gift.

For the purposes of this document, records are defined in a very broad sense to mean any materials for which NARA has established physical or legal custody. A record has a fixed content, structure, and a specified context that identifies the record creator, the activity during which the record was made or received, and the relationship to other records of the same creator. See **Appendix A, Glossary of Terms**, for a more complete definition.

Some of the electronic records transferred into the system will remain under the authority and control of their creators for varying periods of time. NARA will assume legal custody of other electronic records. Some of the electronic records will be "temporary" and will be kept in the system only for a finite time, which may vary from a few years to many decades. "Permanent" electronic records will be preserved by NARA forever.

The system will provide comprehensive and coherent support for workflow, data management, communications for management processes for all records, and provide all necessary archival processing of electronic records. ERA's automated processes will support the record's producer, archivist, researcher, and other users.

The system context will be Government-wide, and will operate within the context of the Federal Enterprise Architecture. ERA will be capable of interfacing with other applications throughout the Federal Government for transfer of electronic records to NARA, retrieval of such records by their creators, and for records management processes in which NARA interacts with other entities in all three (3) Branches of the Government. The volume and diversity of input and output data, and the expected heavy use of the system, will have considerable impact on the NARA computing environment. Interfaces to other NARA systems, as well as other Government agency systems, will be accommodated by ERA. Specific interfaces are yet to be determined, and will be described in the Internal Interface Requirements Document (IRD) when identified.

2.1.1 External Interfaces

Figure 2-1, External Interfaces Context Diagram, depicts external interfaces with ERA along with the associated data flows.

The data flows are high level, i.e., they are not broken down into data assemblies or individual elements in this part of the document. Following **Figure 2-1** are tables (**Tables 2-1 through 2-5**) representing the different classes of interfaces with ERA, a breakdown of the high level data flowing across the interface, and the direction of each data flow (into or out of ERA).

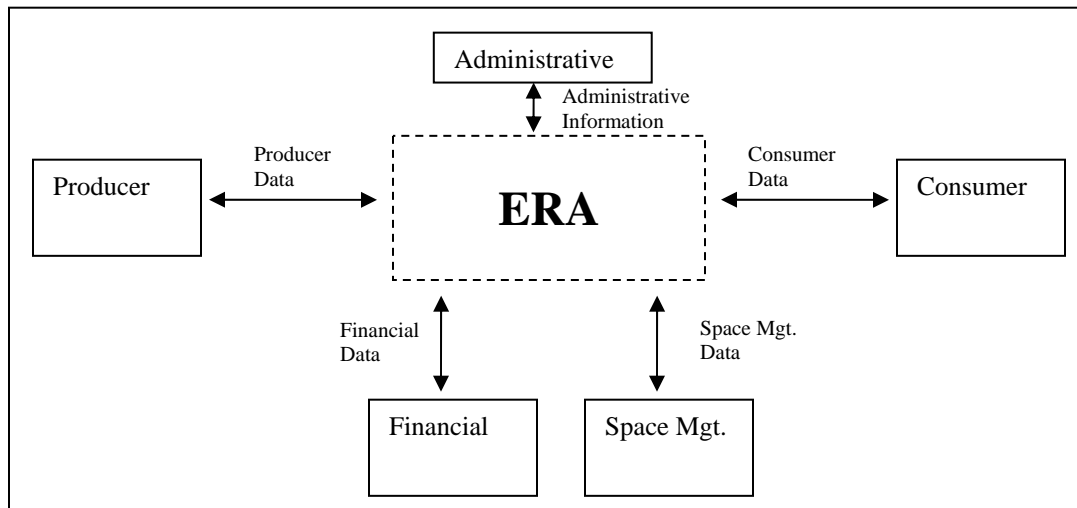


Figure 2-1: External Interfaces Context Diagram

2.1.1.1 Producers

Producers are the various organizations that produce the records managed by ERA. Producers will be providing ERA with most of the data (records, disposition agreements, templates, record lifecycle data, forms, etc.).

Data flow Label	Direction (IN, OUT,BOTH)
Requests, Acknowledgements, Confirmation	BOTH
Approval/Disapproval	BOTH
Notifications/Messages	BOTH
Registration Information	IN
Help Information	OUT
Disposition Agreements	IN
Templates	IN
Electronic Records	IN

Data flow Label	Direction (IN, OUT,BOTH)
Record Lifecycle Data	IN
Report Data	IN
Forms	IN

Table 2-1: Producer Data Flows**2.1.1.2 Financial Systems**

Financial Systems are a class of systems that ERA will interface with as daily business is conducted. ERA will support some services that are fee based (e.g., some subscription services will be fee based; records can be distributed on media for a fee). Financial transactions require a process where 1) the service is requested, 2) the service can be approved by the financial system, and 3) if the service is approved by the financial system, it can be confirmed by the requestor.

Data flow Label	Direction (IN, OUT,BOTH)
Billing/Cost Information	BOTH
Subscription Order Confirmation	OUT
Requests, Acknowledgements, Confirmation	BOTH
Notifications/Messages	OUT
Approval/Disapproval	IN
Report Data	OUT

Table 2-2: Financial Systems Data Flows**2.1.1.3 Space/Inventory Management**

Space/Inventory management systems provide information about space and space usage for storage of physical media on which records are written. ERA will manage the workflow for requests to transfer records into NARA storage and will interface with systems that manage that storage.

Data flow Label	Direction (IN, OUT,BOTH)
Inventory/Space Management Information	OUT
Report Data	OUT
Notifications/Messages	IN
Requests, Acknowledgements, Confirmation	BOTH

Table 2-3: Space/Inventory Management Data Flows

2.1.1.4 Consumer

Consumers are those users of ERA who use (consume) the products of the National Archives and Records Administration. They are typically interested in accessing the records in the archives. Consumers can also request pre-defined or self-service reports and supply report data to be used in reports generated by ERA for internal use.

Data flow Label	Direction (IN, OUT,BOTH)
Requests, Acknowledgements, Confirmation	BOTH
Notifications/Messages	OUT
Search results	OUT
Record Lifecycle Data	OUT
Records (all versions)	OUT
Report Data	BOTH
Registration Information	IN
Help Information	OUT
Billing/Cost Information	BOTH

Table 2-4: Consumer Data Flows

2.1.1.5 Administrative

Administrative systems are those systems that require data related to the support of administrative operations; for example, a metrics system used by NARA management to collect and publish data related to NARA's ability to properly service NARA customers.

Data flow Label	Direction (IN, OUT,BOTH)
Administrative Information	OUT
Report Data	OUT
Security Data	TBD

Table 2-5: Administrative Data Flows

2.2 Major System Capabilities

The ERA system must support NARA's end-to-end archival processes for appraisal and scheduling, disposition, transfer, accessioning, description, maintenance, and access to records. The ERA system will provide capabilities in two (2) different areas.

1. The system must provide decision support for NARA management processes for the lifecycle management of records of all types. This includes supporting

archival processes for such activities as appraisal, scheduling, and description that apply to both electronic and non-electronic records.

2. The system must provide capabilities for automated archival processing of electronic records themselves. These archival processes include:
 - Physical transfers of sets of electronic records, via telecommunications and on physical media, for ingest into ERA;
 - Verification that transferred sets of electronic records conform to disposition agreements;
 - Validation of the representation information for any set of electronic records;
 - Long-term storage of electronic records;
 - Transformations of electronic records to maintain accessibility and authenticity;
 - Characterization of electronic records for archival description;
 - Redaction of restricted content;
 - Search, retrieval, presentation, and output of the records; and
 - Disposal of records authorized for destruction.

To achieve NARA's mission and support the broad range of its responsibilities, the system should eliminate or minimize records' dependence on any specific hardware or software. The system should maximize the types of electronic records and types of digital data it can handle. The system should be able to ingest electronic records from a wide variety of sources, including any entity in the Federal Government or private donors, created using any type of application on any computing platform. The system should be able to ingest electronic records currently in the holdings of NARA. The system should provide discovery and delivery of documentary materials to anyone with an interest and legal right of access, from now until the end of the republic. The system must accommodate unscheduled, permanent, and temporary electronic records regardless of record type, format, or physical media.

2.3 System Constraints and Conditions

This section identifies conditions and constraints that may impact the system architecture or specific components of the system.

2.3.1 Constraints

The following bullets describe constraints identified for ERA:

- ERA will be implemented in a policy neutral manner (designed and implemented with sufficient flexibility such that changes to NARA policy, procedures, business rules, etc., can be accommodated without extensive system rework or redesign)

- ERA will be capable of providing different preservation and access levels depending on:
 - Agreements with transferring entities (referred to as “Producer” in the OAIS model)
 - NARA’s business strategies and priorities
 - Laws and regulations requiring differential controls on access depending both on the type of information and the category of user
 - Technological characteristics of the records, including obsolescence, variations in data quality, and proprietary formats
- ERA’s design and implementation must be flexible and adaptable to changes in hardware, software, communication technology, archival processes, policy, personnel, locations, etc.
- ERA will require appropriate authorization prior to the destruction of electronic records that were appraised as permanent
- ERA will destroy electronic records in accordance with Federal guidance
- ERA will destroy electronic records in accordance with agency standards as defined by NARA
- ERA will check the quality of system generated descriptions against NARA-defined standards
- ERA will check templates according to user supplied rules
- ERA will check that a file output from a transformation retains the specified behaviors of the input data
- ERA will transform electronic record/data types into a hardware and software independent format
- ERA will express representation information in XML format
- ERA will exchange representation information consistent with the Metadata Encoding and Transmission Standard (METS) version 1.3.
- ERA will comply with the American National Standards Institute (ANSI) standard Z39.19-1993, Guidelines for the Construction, Format, and Management of Monolingual Thesauri
- ERA will comply with the International Organization for Standardization (ISO), Guidelines for the Establishment and Development of Monolingual Thesauri
- ERA will export self-describing media containing electronic records from the ERA primary data storage repository
- ERA will import self-describing media containing electronic records into the ERA primary data storage repository
- ERA will not modify electronic records to accommodate physical storage media
- ERA will use storage media that is self-describing
- ERA will store electronic records such that an individual electronic record does not span media volumes
- ERA will utilize archive media that is capable of being manually mounted
- ERA will manage electronic records according to the ownership of the electronic record

- ERA will manage electronic records according to the access restrictions of the record
- ERA will store and process electronic records in environments appropriate to their stated access restrictions
- ERA will prohibit unauthorized alteration of electronic records
- ERA will control access to electronic records in accordance with the records' access restrictions
- ERA will prohibit redaction of the preservation copy of an electronic record
- ERA will interface with external billing systems
- ERA will have no single point of failure

2.3.2 Constraints related to Compliance with Law, Executive Orders, NARA and Federal Regulations, and Other NARA and Federal Policies, Guidance, and Plans

The following bullets describe the regulatory and policy constraints identified for ERA:

- ERA will be developed and maintained in compliance with the Federal Records Act and the Presidential Records Act (44 U.S.C. Chapter 22)
- ERA will be developed and maintained in compliance with NARA and Federal standards, guidelines, and regulations
- ERA will support exchanging records with records management applications that comply with DOD-STD 5015.2
- ERA will comply with NARA regulations in Chapter 36 of the Code of Federal Regulations (CFR) Subchapter B
- ERA will support transfers of records to and from Records Management Applications that conform to Department of Defense (DoD) 5015.2-STD in whole
- ERA will operate in accordance with applicable security guidance and rules
- ERA will operate in accordance with the Federal Information Security Management Act of 2002 (FISMA)
- ERA will operate in accordance with the NARA Policy Directive, NARA 804, Information Technology Systems Security Handbook
- ERA will be designed in the context of NARA's Enterprise Architecture
- ERA will be accessed according to the protocols described in NARA's Target Architecture
- ERA will destroy electronic records in accordance with DOD5220.22-M
- ERA will comply with Section 508 of the Rehabilitation Act of 1973 (29 U.S.C. 794d)
- ERA will comply with the Freedom Of Information Act (FOIA) (5 U.S.C 552, as amended)
- ERA will comply with the Privacy Act (5 U.S.C. 552a, as amended)
- ERA will comply with E.O. 12958, as amended

2.3.3 Conditions

The following conditions apply to ERA.

- ERA will impose no practical limit on the number of hierarchical description levels that may be defined
- ERA will impose no practical limit on the number of authority sources
- ERA will impose no practical restriction on the number of records lifecycle data elements allowed for each record managed by the system
- ERA will accommodate loads as specified in **Appendix B, Table B-2, ERA Record Volume Requirements**
- ERA will be scalable to one (1) exabyte of total storage without major design changes
- ERA will be scalable to 10 teraobjects without major design changes
- ERA will meet or exceed availability requirements as specified in **Appendix B, Table B-1, ERA Availability Requirements**

2.4 User Characteristics

The characteristics of users will vary widely with respect to their knowledge of the assets held by NARA, the functions performed by the user and activities supported by the system, and their frequency of use of the system. ERA must provide a variety of user tools, workbenches, and help functionality to accommodate the needs of a very diverse user community.

Users will include:

- NARA managers and employees with specific supervisory, archival, and records management functions to perform;
- Professional researchers, historians, and authors who need access to NARA's holdings;
- Legal professionals and politicians;
- Genealogists (professional and amateur);
- The general public, with little or no knowledge of NARA's holdings, or of archival practices in general;
- Professional researchers, historians, and authors with considerable knowledge of specific NARA holdings;
- System administrators responsible for the performance and maintenance of the system, as well as administering user accounts; and
- Other federal employees and contractors dealing with records of their agencies or interacting with NARA employees.

2.5 Concepts and Assumptions

ERA must manage all electronic records in compliance with the archival principles of provenance and respect for the original order of the records.

Electronic records fall into two (2) main categories: records of the U.S. Government and donated materials from private sources. Like government records, donated materials are managed in series and kept in the order established by their creators.

The system must be capable of preserving electronic records for varying periods of time, ranging from a few years to forever. For permanent records – those preserved forever – as well as for some temporary records which need to be kept for lengths of time that exceed several generations of information technology, it will be necessary to transform the records from the formats in which they were received to persistent formats. A persistent format is one that is supported by a preservation strategy for diminishing the impacts of technological obsolescence, minimizing dependence on specific hardware and software, and enabling retrieval and output of authentic copies of the records in the future. An ideal persistent format would be self-describing and be able to be validated in accordance with open, non-proprietary standards.

The system must be capable of the presentation and output of authentic copies of electronic records; that is, copies that retain the original content, structure, context, and often the original presentation of the materials transferred to NARA. This does not necessarily entail that all digital properties of electronic records must remain unaltered over time. Continuing change in information technology makes it practically inevitable that it will be necessary and desirable to change the way that electronic records are materialized as digital objects in order to ensure that the records retain their essential content, structure, context, and presentation across generations of hardware and software. The system will be required to deliver electronic records over unlimited time frames. Digital properties that may have to be changed include physical media and physical file characteristics and labels, and also digital data types and related behaviors. However, any change of digital properties must preserve the records' essential characteristics.

ERA will implement formal controls that constrain variables, direct the behavior of the system, or set parameters of the system. Such controls will include templates, business rules, and other appropriate means to manage the structure, syntax, content, context, presentation, and lifecycle of records. NARA will specify templates that identify classes of records, classes of sets of records, record types, digital data types, and records lifecycle transactions. Transferring entities will define and register with NARA schemas that conform to these templates and specify the properties of specific sets or classes of records that they produce and maintain. ERA may implement other formal controls to express essential syntactic, semantic, presentation, or ontological properties and related behaviors of the classes of objects that it governs. The system will apply such controls to manage records lifecycle transactions and other archival processes involving electronic records to

govern the development and implementation of specific preservation strategies, and to enable production of authentic copies of electronic records.

Preserving the context of records requires maintaining the relationships among records that were established by their creators, as well as maintaining the relationship of the records to the creators themselves. Typically, record relationships are established by placing the records in a hierarchical arrangement by grouping records in files, and files in a filing system that may include several levels. Preserving this context requires that the system captures information about the relationships among electronic records and be able to reproduce the structure of the record keeping system and correctly place electronic records in that structure on a target platform. The information about the arrangement defined by the electronic records creators will be captured in appropriate templates, which will be used as a basis for reestablishing the structures and relationships when electronic records are retrieved from storage.

Therefore, the following basic assumptions can be stated.

- Ideally, electronic records should be preserved in persistent and self-describing formats.
- During early operations of the system, electronic records ingested into the system will be predominantly in legacy formats that are subject to rapid obsolescence and are neither self-describing nor able to be validated by open, non-proprietary standards.
- The system must be capable of outputting electronic records that satisfy archival requirements for authenticity.
- The system must be capable of outputting preserved electronic records to target platforms for as long as the electronic records are retained, which may be forever.

2.6 ERA Capabilities by User Class

The major capabilities of the system, arranged by user classes, are defined in the *ERA ConOps* document.

2.7 Requirements Categorization

In this section, the requirements are summarized into categories based on the OAIS model. A brief description of each category, and a summary of the appropriate requirements, is presented in the following subsections.

2.7.1 Records Management (referred to as “Data Management” in the OAIS model)

The system must provide decision support for NARA management processes for the lifecycle management of records of all types. This includes supporting archival processes

for such activities as appraisal, scheduling, and description that apply to both electronic and non-electronic records.

The ERA records management process includes:

- Managing disposition agreements,
- Documentation and workflow management for transfer of physical custody of records,
- Documentation and workflow management for transfer of legal custody of records,
- Archival description of the records,
- Managing authority sources,
- Managing records lifecycle data, and
- Utilizing sample records.

Disposition agreements govern the disposition of records, and contain the disposition instructions for what is to be done with sets of records. Several types of instruments can serve as a disposition agreement, the most prevalent of which is a records schedule. ERA must provide tools for the creation and management of disposition agreements for all types of records. These tools must support archival appraisal to determine the value of the electronic records, as well as the development and management of the disposition agreements that implement the results of appraisal. ERA will have the ability to carry out the disposition instructions contained in the disposition agreements in an automated fashion (for electronic records).

Management of the workflow and documentation for the transfer of physical custody, and the transfer of legal custody, are activities that must be supported by ERA. In order to automate the records lifecycle to the greatest extent feasible, and to keep pace with changing needs, ERA will require a configurable workflow that is able to control both the tasks that the system performs unattended, and tasks that require staff-system interaction. Invocation of ERA's services based on defined business rules will be accomplished through a workflow management system.

The workflow system should be capable of supporting multiple different workflows, corresponding to the different lines of business, different procedures, and variety of tasks that NARA units perform. There should be enough flexibility in the workflow management system to allow the workflow to be changed to accommodate exceptions or changes in the business processes. ERA will provide the capability to "customize" workflows to accommodate these changing business processes and exceptions.

Units of work will be defined, and the system will provide for monitoring the progress of these work units. Input required from users to complete a process will be handled by workflow. Notifications to users regarding workflow processes will be generated.

ERA will have the ability to assign tasks to NARA staff, assign due dates, monitor progress, and note completion of the tasks. Monitoring of staff and system workload will be provided, as well as the capability to adjust workloads to alleviate problems.

Descriptions of records identify the key characteristics of those records. NARA generally describes records at the set level (record group, series, etc.) although some types of records, such as motion pictures, are described at the individual record level. Manual and system generated archival descriptions must be supported. ERA will provide tools to automatically extract records lifecycle data from electronic records themselves, from sources such as disposition agreements and templates, and from other sources, for all types of records. ERA will assist archivists in manually creating descriptions. Descriptions must be managed in accordance with NARA defined hierarchies of, and relationships among, records and organizations. The use and management of authority sources for descriptions is required. The ability to link to related records lifecycle data within the system will be available.

Information about electronic records will sometimes be received with those records. Additional information will accumulate throughout the records' lifecycle. ERA must provide the capability to collect and manage this information.

2.7.2 Preservation (referred to as “Preservation Planning” in the OAIS model)

Electronic records are created using the software and hardware available at the time of their creation. Rapidly changing technology results in obsolescence of a given software and hardware platform in a relatively short time. Electronic records created in these obsolete platforms, and dependent upon them, are in danger of becoming inaccessible. Continuing change in information technology creates opportunities for improving efficiency and quality, and a concomitant requirement to deliver preserved electronic records using current, state-of-the-art technology. Preservation determines preventive, reactive, and proactive steps to be taken to ensure that the electronic records remain free from corruption, and can be output as authentic copies independently of the information technology used to create, store, transmit, manage, or archivally process them at any time. Preservation must encompass the properties that the electronic records inherit as a result of being digitally encoded, and those that derive from their being records.

The essential requirement that must be addressed in preservation of electronic records is this: how to preserve the essential characteristics of these electronic records and enable the output of authentic copies of electronic records in the face of continuing change in the information technology used to store, retrieve, archivally process, communicate, and manage these records.

A preservation and access plan will be articulated for each set of electronic records that will be preserved in ERA for any length of time. The amount of detail contained within the preservation and access plan will be dependent on the nature of the electronic records to be preserved. For each set of electronic records, the preservation and access plan

identifies the essential properties of the set, and of any defined subsets within the set, that must be preserved. It also identifies the methods that will be applied to preserve those properties, and enables NARA to perform any required services for the set or the electronic records in it. Different preservation strategies and related preservation and access levels will be defined for electronic records within ERA. Each preservation and access plan must specify one of these strategies. A preservation and access plan will be established whenever NARA agrees to accept the transfer of any set of electronic records.

Preservation processes and services will be provided by ERA only for electronic records. The key preservation process result required for all electronic records is the ability to produce authentic copies of the records from stored data. ERA will provide appropriate tools, techniques, and methods to enable output of authentic copies of any electronic records in the system for as long as they need to be maintained.

The requirements for preservation derive from the properties of the preserved information as electronic records and sets of electronic records. Preservation of these properties may, and in some cases must, entail alterations in the digital encoding of the electronic records. Such alterations will include moving stored data to new physical media, and may include changing the way the records are digitally encoded from an obsolescent to a persistent format.

NARA's goal is to preserve electronic records in persistent formats that will enable access to authentic electronic records indefinitely into the future. An ideal persistent format would be self-describing and validating in accordance with open, nonproprietary standards. However, given the size and complexity of the task NARA faces in this area, and given that some records will be preserved for only a relatively short period with a very low expected use, the system will provide a variety of options for preservation. Preservation options must include short-term and intermediate steps, as well as a long term preservation option.

Preservation processes will include the generation, registration, and validation of templates and other controls that will specify the record properties which must be preserved and be linked to methods that will both preserve those copies and support production of additional authentic copies. Any disposition agreement that provides for transfer of electronic records to ERA must be linked to a plan that specifies preservation and access requirements for those records, identifies the lifecycle data and other representation information needed to address those requirements, and specifies the methods that will be used to satisfy them. The system should be able to impose the controls and execute the actions called for in the plan once the electronic records are transferred. Such actions may need to be executed at the start of the transfer process in the transferring entities system.

Preservation of electronic records also entails preserving their arrangement. Records creators organize their records to suit their specific needs. This organization of the records established by the records creators is termed the "original order." It must be

preserved along with the records. In the case of electronic records, preserving the original order entails the ability to materialize the arrangement of records according to that order. In addition, ERA must enable archivists to define additional arrangements (e.g., to identify relationships among records based on a topical theme).

The system must generate and maintain an audit trail of all preservation actions to support certification of the authenticity of records output from the system.

2.7.3 Archival Storage

ERA requires reliable storage of the data that comprises electronic records. Aspects of reliable archival storage include:

- Storage management services;
- Media management to ensure physical integrity of all stored data;
- Identification and location of all the system's assets;
- An inventory of assets that maintains the relationship between the assets and records, files, series, other records sets, and other versions of the same record;
- The management of multiple copies of the system's assets, and
- Media migration.

NARA has a variety of requirements for maintaining and managing multiple copies of system's assets for varying periods of time. These include:

- Storage of redundant copies to support both continuity of operations and data recovery;
- Routine backup of individual occurrences of the system, and
- Storage of versions of electronic records in different digital formats for archival preservation and access purposes.

Media requirements include use of:

- Media that are known to be durable;
- Media that are expected to be available and supported in the market for as long as they need to be retained;
- Media that are capable of being handled in an automated fashion;
- Media that are formatted, labeled, and recorded in accordance with open standards;
- Media that are supported by bit error detection and reporting, as well as by strong error-correction mechanisms; and
- Media which are self-describing and non-encrypted.

Import and export of media must be handled. ERA will support automated media maintenance and tools to recover data from failed media. The capability for migration of

stored data to new media volumes and media types to improve efficiency or reliability is needed.

2.7.4 Security

ERA security includes both protecting assets from inappropriate access and damage, and ensuring continuing and ready access to assets by authorized users. ERA must protect the assets it contains, as well as the system itself, from a variety of threats. Security methods must be applied to system resources and services, users, and information assets.

ERA will receive and store electronic records with a variety of security and access restriction levels. It will be necessary for ERA to recognize the security and access restriction levels of incoming electronic records, and segregate and protect them based on their security and access restriction levels. Protection for assets should include the use of strongly authenticated access to privileged resources (i.e., restricted electronic records or services), supported by a robust audit trail. Assets must be protected against unauthorized access, alteration, or deletion. Data access control schemes will be configurable.

Protection for the ERA system itself should include intrusion detection and deterrence. Access to services will be controlled on a user privilege basis. Again, strong authentication will be employed, in this instance when exchanging data with external sources.

2.7.5 Ingest

Ingest encompasses the process of bringing electronic records into ERA. The ingest process includes:

- Physical transfer of electronic records to ERA, and
- Verification of the transfer contents.

ERA must facilitate the transfer of electronic records. Transferring entities must be able to transfer all types of electronic records in all supported file formats, electronically as well as on media. ERA will accept transfers from transferring entities' systems as defined by the negotiated terms and conditions of the transfer. The system must check the integrity, correctness, and completeness of each transfer and check that the transferred electronic records conform to the terms of the disposition agreement and can be preserved and serviced in accordance with the defined preservation and access plan.

2.7.6 Access

Providing access to ERA's assets requires search capabilities for discovering records, as well as all other assets contained in the system. ERA must be able to provide access to ordered sets of electronic records in the groupings and arrangements established by the records' creators. Providing access entails both providing users with access to anything

they are entitled to receive, and preventing unauthorized access to restricted contents. Access restrictions may apply to entire sets of electronic records, to individual electronic records, or to elements of content within electronic records. The basic law governing access to Federal records requires NARA to provide unrestricted access to any reasonably segregatable information in the National Archives. Other authorities NARA must enforce for access to records include deeds of gift, transfer agreements, and congressional resolutions.

A robust search capability is required. All types of electronic records, as well as all other assets contained in the system, shall be searchable. Searching by description and records lifecycle data must be supported for both electronic and non-electronic records. Searching by record content will be available only for electronic records. Refining and ranking of search results will be available. Users will be able to save and share searches and search result sets. “Mediated” search capabilities (searches performed by NARA staff on behalf of users) will be supported.

Accurate presentation and output is central to ERA’s purpose. The authenticity of the electronic record must be maintained during presentation and output. This includes ensuring that any specified behavior that is part of the essential characteristics of the electronic record shall remain functional when the electronic record is presented or output by ERA. The nature of the behavior that is presented may be dependent on the preservation strategy applied to the record. The assets ERA contains will be made available in a variety of formats and media types. Users may request output copies of electronic records via ERA. If an electronic record is withheld, ERA will provide an explanation of the reason for withholding to the requestor.

ERA will support the review of the assets it contains to identify potentially access restricted information that should be withheld from release either in general or from a specific class of users. ERA will capture and maintain the review determination and supporting information about the determination.

ERA will provide tools for redacting the assets it contains. Automated redaction capabilities will be provided, as well as the capability for redaction performed by a user. Supporting information about the redaction will be captured in the system’s audit trail.

2.7.7 User Interface

The user interface will provide users with access to ERA’s various services. Default interfaces will be provided by ERA to permit different classes of users to perform authorized functions. Users will be able to customize interfaces to provide a more favorable environment, better suited to their needs and preferences. Changes to a user’s workbench will be saved and made available to the user in subsequent sessions.

2.7.8 Administration

Administration includes multiple, diverse capabilities at both the user and system level. Administration involves managing user registration and accounts, providing assistance to users, managing communications between users and ERA, maintaining the event log, and providing reporting capabilities. System testing, monitoring, and parameter adjustability requirements are also included. Finally, management of system failures is included.

ERA will collect registration information from users, and create user accounts based on the information. Accounts will expire periodically, but users can renew their registration.

ERA will provide user assistance in the form of help screens and online guidance to NARA's business functions. Help desk support functionality will be available.

ERA will manage communication with users. ERA will manage the generation of notices for transmittal to users. Ad hoc notices, as well as standard language notices can be created and sent. Receipt of requests from users will be included, as will tracking responses to requests.

ERA will maintain an event log. All system events will be eligible for logging, but NARA can configure the log functionality by specifying what type of events to log, and the retention period for types of log entries. The event log will provide the information necessary for an audit trail of system and user initiated activities.

Reporting capability will be provided. A number of pre-defined reports will be supported. Reports can be saved. Ad hoc reporting will be available.

The capability to perform end-to-end system testing is needed. The monitoring of the system state, and the capability to adjust system parameters, is required. Management of system failures via identification and isolation leading to resolution is required, as is notification in the event of a failure.

Inventory and configuration management capabilities will be provided by the system.

2.7.9 System Characteristics

System characteristics include a mix of functional, architectural, and performance-related requirements. Subscriptions, service management, load, and availability requirements are included.

Subscriptions will be supported by ERA. Subscription services provide for creation and management of subscriptions to system services. Subscriptions can be scheduled, or triggered by a system event.

Service management consists of support for queuing of services, monitoring service progress, prioritization of services, preemption of a service, suspension of service processing, and resumption of services. Check pointing is required, as is the ability to limit service execution times.

NARA's Enterprise Architecture will be taken into account during the design of ERA.

Availability requirements are on a per-service basis and are addressed in **Appendix B, Table B-1, ERA Availability Requirements**. For the purposes of these availability requirements, the specified services are composed of Commercial Off The Shelf (COTS), and/or custom-developed hardware and software.

See **Appendix B, Requirements Tables**, for further details.

3.0 Requirements List

The requirements in the Requirements List are numbered independently of the numbering of the rest of this document. The requirement numbers do not correspond to the section numbering in the rest of the document.

The requirements numbers used in this RD are structured to indicate decomposition of the requirements, from the general to the more detailed, in several levels. The requirements with only one (1) number in their requirement number (e.g., ERA1, ERA12, ERA28, etc.) are the highest level, most general requirements. Requirements with two (2) numbers separated by a dot in their requirement number (e.g., ERA1.1, ERA6.7, ERA12.14) are the next level of decomposition of their corresponding high level requirement (e.g., ERA1.1, ERA 1.2, ERA1.3 are each first level decompositions of ERA1). Requirements with three (3) numbers separated by dots in the requirement numbers (e.g., ERA1.1.1, ERA2.3.4, etc.) are decompositions of the corresponding next higher level requirement (e.g., ERA2.3.4 is a decomposition of ERA2.3, which is a decomposition of ERA2). The order of requirements within a particular level does not imply any sort of hierarchical or decomposition relationship between these requirements (e.g., ERA2.1 is not "more important" than ERA2.4. ERA2.4 does not decompose ERA2.1 just because ERA2.1 comes first.) The only relationship between requirements at a given level is that they decompose the next higher level requirement (e.g., ERA2.1 and ERA2.4 both decompose ERA2). The indentation of the successive levels of requirements also helps to indicate a requirements level.

Records Management

ERA1 The system shall manage the disposition of records

ERA1.1 The system shall provide the capability to manage disposition agreements

ERA1.1.1 The system shall provide the capability for users to create disposition agreements

ERA1.1.1.1 The system shall provide the capability for users to create templates for disposition agreements

ERA1.1.1.2 The system shall provide the capability for users to create disposition agreements based on templates

ERA1.1.1.3 The system shall provide the capability for users to create new disposition agreements based on existing disposition agreements

ERA1.1.1.4 The system shall create suggested dispositions based on a series of questions answered by the user

ERA1.1.1.4.1 The system shall recommend a workflow for records based on their suggested disposition

ERA1.1.1.4.2 The system shall indicate the level of confidence in the suggested disposition to the user

ERA1.1.2 The system shall store disposition agreements

ERA1.1.2.1 The system shall assign a unique identifier to each disposition agreement

ERA1.1.3 The system shall provide the capability for users to assign a status to a disposition agreement

ERA1.1.3.1 The system shall report on the status of a disposition agreement upon request

ERA1.1.4 The system shall provide the capability for users to modify disposition agreements

ERA1.1.4.1 The system shall provide the capability for users to delete disposition agreements

ERA1.1.5 The system shall manage versioning of disposition agreements

ERA1.1.6 The system shall provide the capability to import disposition agreements

ERA1.1.6.1 The system shall provide the capability to import approved disposition agreements

ERA1.1.6.2 The system shall provide the capability to import proposed disposition agreements

ERA1.1.7 The system shall provide the capability for users to approve disposition agreements

ERA1.1.7.1 The system shall provide the capability for users to submit disposition agreements for approval

ERA1.1.8 The system shall provide the capability for disposition agreements to contain disposition instructions

ERA1.1.8.1 The system shall provide the capability for disposition agreements to contain disposition instructions that can be implemented by the system

ERA1.1.8.2 The system shall check the disposition instructions contained in disposition agreements to ensure that they can be implemented by the system

ERA1.1.9 The system shall provide the capability for users to define relationships between disposition agreements

ERA1.1.10 The system shall provide the capability for users to include records lifecycle data about records in disposition agreements

- ERA1.1.11 The system shall check disposition agreements against NARA standards
 - ERA1.1.11.1 The system shall check disposition agreements for conformance to the appropriate template
 - ERA1.1.11.2 The system shall provide the results of checking the disposition agreement to the user
- ERA1.1.12 The system shall search existing disposition agreements to identify those related to a proposed disposition agreement
 - ERA1.1.12.1 The system shall compare disposition agreements to identify those which cover similar records
 - ERA1.1.12.2 The system shall compare items in proposed disposition agreements with items in existing disposition agreements to identify duplications
- ERA1.1.13 The system shall pre-fill agency information from an agency's ERA registration into the disposition agreement when available
- ERA1.1.14 The system shall contain default disposition agreements
- ERA1.1.15 The system shall capture lifecycle data from disposition agreements
- ERA1.1.16 The system shall provide the capability for users to access disposition agreements in all stages of the approval process
- ERA1.1.17 The system shall report on whether records are covered by more than one disposition agreement
- ERA1.2 The system shall manage requests to transfer records
 - ERA1.2.1 The system shall confirm that the transfer is authorized
 - ERA1.2.1.1 The system shall store information about the authorization to transfer
 - ERA1.2.1.2 The system shall confirm that the transfer is covered under an existing disposition agreement
 - ERA1.2.1.3 The system shall confirm that the user initiating the transfer is authorized to do so
 - ERA1.2.2 The system shall store information about the volume of the transfer
 - ERA1.2.3 The system shall store information about the duration of the transfer
 - ERA1.2.4 The system shall provide the capability to associate transfers with registered templates
 - ERA1.2.5 The system shall provide the capability to disallow the transfer of records
 - ERA1.2.6 The system shall manage requests by transferring entities to transfer records from transferring entities to ERA
 - ERA1.2.7 The system shall manage requests by NARA to transfer records from transferring entities to ERA
- ERA1.3 The system shall provide the capability to transfer legal custody of records to NARA
 - ERA1.3.1 The system shall provide the capability to obtain formal acceptance of records into NARA legal custody
 - ERA1.3.1.1 The system shall provide the capability to disapprove the acceptance of records into NARA legal custody
 - ERA1.3.1.2 The system shall obtain appropriate authorizations from NARA to accept records into NARA legal custody
 - ERA1.3.1.3 The system shall obtain appropriate authorizations from transferring entities to accept records into NARA legal custody

- ERA1.3.2 The system shall require appropriate authorization prior to the destruction of electronic records that were appraised as permanent
- ERA1.4 The system shall provide the capability to export any electronic record from ERA to other entities
- ERA1.4.1 The system shall provide the capability to export individual electronic records from ERA to other entities
 - ERA1.4.2 The system shall provide the capability to export sets of electronic records from ERA to other entities
 - ERA1.4.3 The system shall remove the exported electronic records from ERA
 - ERA1.4.4 The system shall provide the capability to export all versions of any electronic record stored in ERA
 - ERA1.4.5 The system shall preserve the structure of all digital components when electronic records are exported
 - ERA1.4.6 The system shall preserve the content of all digital components when electronic records are exported
 - ERA1.4.7 The system shall provide the capability to export electronic records with the records' lifecycle data
 - ERA1.4.7.1 The system shall provide the capability to export electronic records without the records' lifecycle data
 - ERA1.4.8 The system shall provide the capability to export electronic records with the records' associated descriptions
 - ERA1.4.8.1 The system shall provide the capability to export electronic records without the records' associated descriptions
- ERA1.5 The system shall provide the capability to destroy any electronic record
- ERA1.5.1 The system provide the capability to queue electronic records for destruction based on disposition instructions
 - ERA1.5.2 The system shall provide the capability for a user to select electronic records for destruction
 - ERA1.5.3 The system shall confirm that all required authorizations have been received prior to destroying electronic records
 - ERA1.5.4 The system shall provide the capability to destroy the electronic records lifecycle data associated with a destroyed electronic record
 - ERA1.5.4.1 The system shall provide the capability to destroy electronic records lifecycle data at a different time as the destruction of the electronic record itself
 - ERA1.5.5 The system shall destroy electronic records in accordance with Federal guidance
 - ERA1.5.6 The system shall provide the capability to destroy all electronic copies of an electronic record
 - ERA1.5.7 The system shall provide the capability to destroy all electronic versions of an electronic record
 - ERA1.5.8 The system shall certify the destruction of electronic records
 - ERA1.5.8.1 The system shall provide documentation to certify the destruction of electronic records
 - ERA1.5.9 The system shall destroy electronic records such that the electronic records cannot be recovered

- ERA1.5.10 The system shall destroy electronic records in accordance with DOD5220.22-M
- ERA1.5.11 The system shall destroy electronic records in accordance with agency standards as defined by NARA
- ERA1.5.12 The system shall provide a configurable retention period for records that have been selected for destruction, wherein the destruction of the records could be averted within the specified timeframe
- ERA1.6 The system shall automate the implementation of disposition instructions for electronic records
 - ERA1.6.1 The system shall provide the capability for users to suspend automatic implementation of any disposition instruction
 - ERA1.6.2 The system shall provide the capability for users to resume automatic implementation of any suspended disposition instruction
 - ERA1.6.3 The system shall provide the capability to implement changed disposition instructions
 - ERA1.6.3.1 The system shall recognize when a disposition instruction contained in a disposition agreement has been changed
 - ERA1.6.3.2 The system shall identify all records affected by a changed disposition instruction
 - ERA1.6.3.3 The system shall implement a changed disposition instruction against all records affected by the disposition instruction change
- ERA1.7 The system shall provide the capability to project scheduled transfers in accordance with disposition agreements
- ERA1.8 The system shall provide tools to package records in preparation for transfer to ERA
- ERA1.9 The system shall provide tools for the transfer of records to ERA
- ERA1.10 The system shall provide the capability to exchange records with records management applications that comply with DOD-STD 5015.2
- ERA1.11 The system shall provide capabilities for appraisal
 - ERA1.11.1 The system shall provide the capability for users to create appraisal reports
 - ERA1.11.2 The system shall provide the capability for users to access appraisal reports
 - ERA1.11.3 The system shall provide the capability for users to modify appraisal reports
 - ERA1.11.4 The system shall provide the capability for users to delete appraisal reports
 - ERA1.11.5 The system shall provide the capability to associate appraisal reports with disposition agreements
 - ERA 1.11.5.1 The system shall provide the capability to associate appraisal reports with items in disposition agreements
 - ERA1.11.6 The system shall capture lifecycle data from appraisal reports

ERA2 The system shall provide workflow management

- ERA2.1 The system shall invoke its services based on business rules
 - ERA2.1.1 The system shall provide the capability to define business rules to the system

- ERA2.1.2 The system shall provide the capability for mandatory approvals as exit criteria for business processes
- ERA2.2 The system shall provide the capability to manage units of work
 - ERA2.2.1 The system shall provide the capability to define units of work
 - ERA2.2.2 The system shall provide the capability to assign sets of records to units of work
 - ERA2.2.3 The system shall provide the capability to queue units of work
 - ERA2.2.4 The system shall provide the capability to suspend processing of units of work
 - ERA2.2.5 The system shall provide the capability to resume processing of units of work that were suspended
 - ERA2.2.6 The system shall provide the capability to track the status of units of work
 - ERA2.2.7 The system shall report on the status of units of work
 - ERA2.2.8 The system shall provide the capability to define timeframes for completion of units of work
 - ERA2.2.9 The system shall provide the status of a unit of work at completion
- ERA2.3 The system shall provide the capability to manage workflows
 - ERA2.3.1 The system shall provide the capability to create workflows
 - ERA2.3.2 The system shall provide the capability to delete workflows
 - ERA2.3.3 The system shall provide the capability to integrate forms into workflows
 - ERA2.3.4 The system shall provide the capability to modify workflows
 - ERA2.3.5 The system shall provide the capability to manage multiple workflows simultaneously
 - ERA2.3.6 The system shall enforce sequential completion of workflows
- ERA2.4 The system shall provide the capability for dynamic manipulation of workflows
 - ERA2.4.1 The system shall provide the capability to queue workflows
 - ERA2.4.2 The system shall provide the capability to suspend workflows
 - ERA2.4.3 The system shall provide the capability to resume a suspended workflow
 - ERA2.4.4 The system shall provide the capability to cancel a workflow
 - ERA2.4.5 The system shall provide the capability to adjust the priority of a workflow
- ERA2.5 The system shall estimate resource requirements associated with a workflow
 - ERA2.5.1 The system shall make estimated resource requirements associated with a workflow available to other systems
- ERA2.6 The system shall manage online forms
 - ERA2.6.1 The system shall provide the capability for users to create online forms
 - ERA2.6.2 The system shall provide the capability for users to access online forms
 - ERA2.6.3 The system shall check online forms for correctness
 - ERA2.6.4 The system shall provide the capability for users to update online forms
 - ERA2.6.5 The system shall provide the capability for users to delete online forms
 - ERA2.6.6 The system shall provide the capability for users to fill out online forms
 - ERA2.6.7 The system shall provide the capability for users to approve filled out forms
 - ERA2.6.8 The system shall check user supplied data on online forms
- ERA2.7 The system shall provide the capability to notify users about workflow processes
 - ERA2.7.1 The system shall provide the capability to associate notifications with workflows

- ERA2.7.2 The system shall provide the capability to change notifications attached to workflows
- ERA2.7.3 The systems shall provide the capability to delete notifications attached to workflows
- ERA2.8 The system shall provide the capability to assign tasks to users based on business rules
 - ERA2.8.1 The system shall provide the capability to queue tasks
 - ERA2.8.2 The system shall provide the capability for users to view queues of tasks
 - ERA2.8.3 The system shall provide the capability for users to select tasks from queues of work assigned to them
- ERA2.9 The system shall provide the capability to prioritize any queue
- ERA2.10 The system shall manage FOIA requests
- ERA2.11 The system shall manage Privacy Act requests

ERA3 The system shall provide the capability for descriptions

- ERA3.1 The system shall provide the capability for description of records at multiple levels
 - ERA3.1.1 The system shall provide the capability for users to describe sets of records
 - ERA3.1.1.1 The system shall provide the capability to describe collections
 - ERA3.1.1.2 The system shall provide the capability to describe record groups
 - ERA3.1.1.3 The system shall provide the capability to describe series
 - ERA3.1.1.4 The system shall provide the capability to describe file units
 - ERA3.1.1.5 The system shall provide the capability to describe any set of records defined by NARA
 - ERA3.1.2 The system shall provide the capability for item level descriptions
- ERA3.2 The system shall provide the capability for hierarchical descriptions
 - ERA3.2.1 The system shall provide the capability for hierarchical descriptions of sets of records
 - ERA3.2.2 The system shall provide the capability for hierarchical descriptions of organizations
 - ERA3.2.3 The system shall provide the capability for users to define new hierarchical description levels
 - ERA3.2.4 The system shall impose no practical limit on the number of hierarchical description levels that may be defined
- ERA3.3 The system shall provide the capability to create descriptions for all records
 - ERA3.3.1 The system shall provide the capability to create descriptions by users
 - ERA3.3.1.1 The system shall provide the capability to create new descriptions by users
 - ERA3.3.1.2 The system shall provide the capability for users to modify existing descriptions to create new descriptions
 - ERA3.3.1.3 The system shall provide users with all previously collected records lifecycle data regarding the records to support creation of descriptions
 - ERA3.3.2 The system shall generate descriptions using information gathered throughout the records lifecycle

ERA3.3.2.1 The system shall provide the capability for users to select whether or not to have the system create system generated descriptions

ERA3.3.2.2 The system shall provide the capability for users to select the hierarchical level of system generated descriptions

ERA3.3.2.3 The system shall provide the capability to integrate information provided by approved sources into system generated descriptions

ERA3.3.2.4 The system shall provide the capability to integrate information provided by other functions of ERA into system generated descriptions

ERA3.3.2.5 The system shall check the quality of system generated descriptions against NARA-defined standards

ERA3.4 The system shall provide the capability to link descriptions at all levels with the assets they describe

ERA3.5 The system shall provide the capability to import previously created descriptions from other systems

ERA3.6 The system shall provide the capability to export descriptions

ERA3.7 The system shall provide the capability to update descriptions

ERA3.7.1 The system shall provide capability for users to update descriptions

ERA3.7.2 The system shall update set-level descriptions in response to accretions of additional records to a set

ERA3.8 The system shall provide the capability to approve descriptions

ERA3.9 The system shall provide the capability to manage versioning of descriptions

ERA3.10 The system shall provide the capability to assign a status to descriptions to indicate where the description is in the approval process

ERA3.11 The system shall provide the capability to delete descriptions

ERA3.11.1 The system shall provide the capability to delete any version of a description

ERA3.12 The system shall provide the capability to associate related materials with descriptions

ERA3.12.1 The system shall provide the capability to link to related resources from within descriptions

ERA3.13 The system shall accept description information about records provided in electronic forms

ERA3.14 The system shall provide the capability to include notes fields in descriptions

ERA3.15 The system shall provide the capability to describe things other than records

ERA3.16 The system shall provide the capability to annotate records

ERA4 The system shall manage authority sources

ERA4.1 The system shall provide the capability to create authority sources within ERA

ERA4.2 The system shall provide the capability to access authority sources

ERA4.3 The system shall provide the capability to delete authority sources

ERA4.4 The system shall provide the capability to update authority sources

ERA4.5 The system shall provide the capability to link to authority sources

ERA4.6 The system shall provide the capability to import authority sources

ERA4.7 The system shall provide the capability to use authority sources

ERA4.7.1 The system shall provide the capability to use authority sources during creation of descriptions

ERA4.7.2 The system shall provide the capability to use authority sources during searches

ERA4.8 The system shall manage complex thesauri

ERA4.9 The system shall provide the capability to combine authority sources

ERA4.10 The system shall impose no practical limit on the number of authority sources

ERA5 The system shall provide the capability to manage records lifecycle data

ERA5.1 The system shall impose no practical restriction on the number of records lifecycle data elements allowed for each record managed by the system

ERA5.2 The system shall impose no practical restriction on the number of records lifecycle data elements allowed for each record set managed by the system

ERA5.3 The system shall provide the capability to define sets of records lifecycle data elements for sets of electronic records

ERA5.4 The system shall extract records lifecycle data elements from electronic records

ERA5.5 The system shall extract records lifecycle data elements from templates

ERA5.6 The system shall extract records lifecycle data elements from disposition agreements

ERA5.7 The system shall provide the capability to define representation information for electronic records

ERA5.8 The system shall provide the capability to check that electronic records correspond to their defined representation information

ERA6 The system shall provide capabilities for sample records

ERA6.1 The system shall provide the capability to accept transfers of sample electronic records

ERA6.2 The system shall provide access to transfers of sample records

ERA6.3 The system shall provide the capability to record information resulting from review of sample electronic records

ERA6.4 The system shall provide the capability to remove sample electronic records

ERA6.4.1 The system shall provide the capability to destroy sample electronic records

ERA6.4.2 The system shall provide the capability to return sample electronic records to the transferring entity

ERA6.5 The system shall provide the capability to use sample electronic records to test system processes

ERA6.6 The system shall check the authenticity of sample electronic records

ERA6.6.1 The system shall report the results of checking sample electronic records

Preservation

ERA7 The system shall provide the capability to manage templates

ERA7.1 The system shall provide a template repository

ERA7.2 The system shall provide the capability for managing templates within the template repository

ERA7.2.1 The system shall provide the capability for users to submit templates to the template repository

ERA7.2.2 The system shall provide the capability to access templates in the template repository

ERA7.2.3 The system shall provide the capability to modify templates in the template repository

ERA7.2.4 The system shall provide the capability to delete templates from the template repository

ERA7.2.5 The system shall identify templates for which all associated electronic records have been destroyed

ERA7.3 The system shall provide the capability to produce draft templates

ERA7.4 The system shall provide the capability for users to create new templates

ERA7.4.1 The system shall provide the capability to create a new template based on an electronic record

ERA7.4.2 The system shall provide the capability to create a new template based on a disposition agreement

ERA7.4.3 The system shall provide the capability to create a new template based on a set of electronic records

ERA7.4.4 The system shall provide model templates

ERA7.4.4.1 The system shall provide the capability to create a new template based on a model template

ERA7.5 The system shall provide the capability to approve templates

ERA7.6 The system shall check templates

ERA7.6.1 The system shall check templates according to user supplied rules

ERA7.6.1.1 The system shall check templates for conformance to applicable NARA standards

ERA7.6.2 The system shall check templates to ensure their functionality

ERA7.6.2.1 The system shall provide the results of the template check

ERA7.6.3 The system shall check that templates are well-formed

ERA7.6.4 The system shall check associations between templates

ERA7.7 The system shall associate templates with defined domains

ERA7.7.1 The system shall provide the capability to associate templates with abstract sets of electronic records

ERA7.7.2 The system shall provide the capability to associate templates with empirical sets of electronic records

ERA7.7.3 The system shall provide the capability to associate templates with transactions in the lifecycle management of records

ERA7.7.4 The system shall provide the capability to associate templates with digital data types

ERA7.7.5 The system shall provide the capability to associate templates with mappings of one data type to another

ERA7.8 The system shall provide the capability to associate templates with other system objects

ERA7.8.1 The system shall provide the capability to associate electronic records with registered templates

ERA7.8.2 The system shall provide the capability to associate disposition agreements with registered templates

ERA7.8.3 The system shall provide the capability to associate representation information for electronic records with registered templates

ERA7.8.4 The system shall provide the capability to associate registered templates with transactions

ERA7.8.5 The system shall provide the capability for registered templates to reference other registered templates

ERA7.9 The system shall provide the capability for versioning of templates

ERA7.10 The system shall provide the capability for hierarchies of templates

ERA7.11 The system shall provide the capability to import templates from external systems' template repositories into the ERA template repository

ERA7.12 The system shall provide the capability to output templates

ERA8 The system shall provide capabilities for preserving electronic records

ERA8.1 The system shall manage the preservation process of electronic records

ERA8.1.1 The system shall provide the capability for preservation assessment of electronic records

ERA8.1.1.1 The system shall provide the capability for preservation assessments of electronic records scheduled for transfer to NARA

ERA8.1.1.1.1 The system shall provide the capability for preservation assessments of electronic records planned for transfer to NARA but not scheduled

ERA8.1.1.2 The system shall provide the capability for preservation assessment of electronic records at the time of ingest

ERA8.1.1.3 The system shall provide the capability for preservation assessment of electronic records already stored in ERA

ERA8.1.1.4 The system shall provide the capability to apply templates in preservation assessment

ERA8.1.2 The system shall provide the capability to schedule the automatic execution of preservation processing

ERA8.1.3 The system shall provide the capability to use the user interface to initiate transformation of electronic records by the system

- ERA8.1.4 The system shall provide the capability to mass process sets of electronic records
- ERA8.1.4.1 The system shall provide the capability to mass process sets of data files
- ERA8.1.5 The system shall maintain an audit trail of all preservation processing
- ERA8.1.5.1 The system shall include the preservation audit trail within the records lifecycle data
- ERA8.1.6 The system shall preserve the integrity of records throughout the preservation processes
- ERA8.1.6.1 The system shall ensure that relationships among records are not altered in preservation processing
 - ERA8.1.6.2 The system shall ensure that all data files stored in the system are associated with the records they constitute
 - ERA8.1.6.2.1 The system shall ensure that all data files stored in the system are associated with the sets of electronic records they constitute
 - ERA8.1.6.3 The system shall maintain electronic record content across preservation processes
 - ERA8.1.6.4 The system shall ensure that all specified behavior associated with an electronic record is maintained across preservation processes
 - ERA8.1.6.4.1 The system shall provide the capability to specify which behaviors of electronic records must be maintained across preservation processes
 - ERA8.1.6.5 The system shall maintain electronic record context across preservation processes
 - ERA8.1.6.6 The system shall maintain specified electronic record structure across preservation processes
 - ERA8.1.6.7 The system shall maintain specified electronic record presentation across preservation processes
- ERA8.2 The system shall provide the capability to ingest data files in the digital formats in which they were received
- ERA8.2.1 The system shall provide the capability to store data files in the digital formats in which they were received
- ERA8.3 The system shall capture attributes of all ingested data files
- ERA8.3.1 The system shall capture the identifiers of all ingested data files
 - ERA8.3.2 The system shall capture the data types of all ingested data files
- ERA8.4 The system shall specify the relationship of each ingested data file with an electronic record
- ERA8.4.1 The system shall specify the relationship of each ingested data file with a set of electronic records
- ERA8.5 The system shall provide the capability to transform any ingested data file to a different format
- ERA8.5.1 The system shall have the capability to check that a file output from a transformation retains specified attributes of the input data
 - ERA8.5.2 The system shall have the capability to check that a file output from a transformation retains the specified behaviors of the input data

- ERA8.5.3 The system shall specify the relationship of each transformed data file to an electronic record
- ERA8.5.3.1 The system shall specify the relationship of each transformed data file to a set of electronic records
- ERA8.6 The system shall provide the capability to transform electronic records into persistent formats
- ERA8.6.1 The system shall provide the capability to transform electronic record/data types into a hardware and software independent format
- ERA8.6.1.1 The system shall check the results of transformations for conformance with assigned templates
- ERA8.6.1.2 The system shall provide the capability to report the results of transformations
- ERA8.6.1.3 The system shall provide the capability to flag records that have undergone incomplete transformations
- ERA8.6.1.4 The system shall provide the capability to flag records that have undergone incorrect transformations
- ERA8.6.1.5 The system shall provide the capability to correct problems with transformations
- ERA8.6.1.6 The system shall provide the capability to reinsert corrected transformations
- ERA8.7 The system shall store the files output from preservation processes
- ERA8.7.1 The system shall store the files output from format transformation
- ERA8.7.2 The system shall store the files output from transformation to a persistent format
- ERA8.8 The system shall provide foreign language extensibility such that foreign language electronic records may be preserved in the future without the need for major redesign
- ERA8.9 The system shall provide the capability for preservation planning
- ERA8.9.1 The system shall provide the capability for users to create preservation and access plans
- ERA8.9.2 The system shall provide the capability to access preservation and access plans
- ERA8.9.3 The system shall provide the capability for users to update preservation and access plans
- ERA8.9.4 The system shall provide the capability for users to delete preservation and access plans
- ERA8.9.5 The system shall provide the capability for users to associate a preservation and access plan with electronic records
- ERA8.9.6 The system shall provide the capability for users to associate a preservation and access plans with an item in a disposition agreement
- ERA8.9.7 The system shall provide the capability for the preservation and access plan to define the preservation and access level for the electronic records to which it is associated
- ERA8.9.8 The system shall provide the capability for the preservation and access plan to define the access methods for the electronic records to which it is associated

ERA9 The system shall provide the capability for arrangements of electronic records

ERA9.1 The system shall provide the capability to provide electronic records to users in accordance with any defined arrangement

ERA9.2 The system shall provide the capability for users to input data defining an arrangement of records

ERA9.2.1 The system shall provide the capability to use information provided by the transferring entity to determine the arrangement

ERA9.2.2 The system shall provide the capability to use templates provided by the transferring entity to determine the arrangement

ERA9.3 The system shall provide the capability to recreate the arrangement of electronic records as defined in information provided by the transferring entity

ERA9.4 The system shall provide the capability for multiple arrangements

ERA9.4.1 The system shall manage versions of arrangements

ERA9.4.2 The system shall provide the capability to define arrangements of electronic records in addition to the original order

ERA9.4.3 The system shall provide the capability to implement arrangements of electronic records in addition to the original order

ERA9.4.4 The system shall provide the capability to present arrangements of electronic records in addition to the original order

ERA9.4.5 The system shall provide the capability to define the relationship between an electronic record in one arrangement and an electronic record in another arrangement

ERA9.5 The system shall provide the capability to delete arrangements

ERA9.6 The system shall provide the capability to associate electronic records with a defined arrangement

ERA9.7 The system shall provide the capability to define the position of an electronic record in an arrangement

ERA9.8 The system shall provide the capability for hierarchical grouping of sets of electronic records within an arrangement

ERA9.9 The system shall provide the capability to associate additional electronic records with an arrangement over time

ERA9.10 The system shall provide the capability to associate additional sets of electronic records with an arrangement over time

ERA9.11 The system shall require that an original order be defined for any set of records in the system

ERA9.11.1 The system shall provide the capability to designate a defined arrangement as the original arrangement of a set of records

ERA9.11.2 The system shall permit only one arrangement to be defined as the original order for any set of records in the system

Archival Storage

ERA10 The system shall store assets

ERA10.1 The system shall provide the capability to store copies of electronic records

ERA10.1.1 The system shall identify the version of the electronic record as transferred from the transferring entity

ERA10.1.2 The system shall store a copy of the electronic records produced as a result of preservation processing

ERA10.1.3 The system shall provide the capability to replace copies with new versions

ERA10.1.4 The system shall produce copies of all assets for off-site storage

ERA10.2 The system shall provide the capability to manage assets

ERA10.2.1 The system shall provide the capability to export self-describing media containing assets from the ERA data storage repository

ERA10.2.2 The system shall provide the capability to import self-describing media containing electronic records into the ERA primary data storage repository

ERA10.2.3 The system shall provide the capability to recover any electronic record in the event of catastrophic loss

ERA10.2.4 The system shall provide the capability for location-transparent access to all of the assets it contains

ERA10.2.5 The system shall maintain an inventory of all of the assets it contains

ERA10.2.5.1 The system shall provide the capability to report on its inventory

ERA10.2.5.2 The system shall maintain an archive file directory defining the physical locations of all electronic records within the system

ERA10.2.5.3 The system shall provide the capability to recover the archive electronic file directory

ERA10.2.6 The system shall provide the capability to track information about the movement of electronic files

ERA10.2.7 The system shall provide the capability to check the inventory of the archive against the archive electronic file directory

ERA11 The system shall provide automated media handling

ERA11.1 The system shall provide a physical media tracking system

ERA11.2 The system shall provide the capability to print archive media identification labels

ERA11.3 The system shall provide the capability for automated access to assets stored on removable archive media

ERA12 The system shall provide media management

ERA12.1 The system shall provide the capability for automated movement of electronic records to different media to accommodate new technology

ERA12.2 The system shall not modify electronic records to accommodate physical storage media

ERA12.3 The system shall use storage media that is self-describing

ERA12.4 The system shall provide tools for recovering electronic records from failed media

ERA12.5 The system shall store electronic records such that an individual electronic record does not span media volumes

ERA12.6 The system shall provide active safeguards to protect against archive media degradation

ERA12.7 The system shall statistically monitor the raw Bit Error Rate (BER) of storage media in the archive

ERA12.8 The system shall statistically monitor the corrected Bit Error Rate (BER) of storage media in the archive

ERA12.9 The system shall manage refreshment of archive media

ERA12.10 The system shall manage copying of archive media

ERA12.11 The system provide the capability to use archive media that is capable of being manually mounted

Security

ERA13 The system shall manage security for electronic records

ERA13.1 The system shall provide the capability to manage electronic records according to the ownership of the electronic record

ERA13.2 The system shall provide the capability to manage electronic records according to the access restrictions of the record

ERA13.2.1 The system shall provide the capability to control data up to the Top Secret Sensitive Compartmented Information (TS/SCI) level

ERA13.2.2 The system shall physically separate records classified as Top Secret or higher from other records

ERA13.3 The system shall provide the capability to recognize the access restrictions of electronic records as applied by the transferring entity

ERA13.4 The system shall recognize multiple access restriction levels defined by NARA

ERA13.5 The system shall provide the capability to parse the content of electronic records to identify potentially access restricted content

ERA13.5.1 The system shall make recommendations as to the potential access restriction level of electronic records

ERA13.5.1.1 The system shall make access restriction level recommendations based on NARA-defined rules

ERA13.5.1.2 The system shall make access restriction level recommendations based on comparing record contents with defined lists of terms

- ERA13.5.2 The system shall report the results of parsing an electronic record for potentially access restricted content
- ERA13.5.2.1 The system shall indicate any content it identifies as potentially access restricted
 - ERA13.5.2.2 The system shall report on the basis on which access restriction recommendations were made
 - ERA13.5.2.3 The system shall provide the capability to summarize the results of parsing an electronic record for potentially access restricted content
 - ERA13.5.2.4 The system shall provide the capability to summarize the results of parsing a set of electronic records for potentially access restricted content
- ERA13.5.3 The system shall provide the capability for users to confirm the results of examination of records for potentially access restricted content
- ERA13.5.3.1 The system shall provide the capability for users to override any access restriction recommendation made by the system
 - ERA13.5.3.1.1 The system shall provide the capability for users to override the annotation of content as potentially access restricted
 - ERA13.5.3.1.2 The system shall provide the capability for users to override the basis for annotating of content as potentially access restricted
- ERA13.6 The system shall provide the capability for users to designate the potential access restrictions of electronic records
- ERA13.6.1 The system shall provide the capability for users to annotate any portion of the content of an electronic record as potentially access restricted
 - ERA13.6.2 The system shall provide the capability for users to annotate the content of an electronic record as potentially access restricted using any level of access restriction defined by NARA
 - ERA13.6.3 The system shall provide the capability for users to indicate the basis for annotating content as potentially access restricted
 - ERA13.6.4 The system shall provide the capability for users to remove potential access restriction annotations
- ERA13.7 The system shall segregate electronic records during ingest based on potential access restrictions
- ERA13.7.1 The system shall separate incoming electronic records of undetermined access restrictions from the rest of ERA's assets until the access restrictions of the incoming electronic records can be determined
 - ERA13.7.2 The system shall store electronic records that have been identified as potentially access restricted in a separate area pending review
- ERA13.8 The system shall process electronic records in environments appropriate to their stated access restrictions
- ERA13.9 The system shall prohibit unauthorized alteration of electronic records
- ERA13.10 The system shall prohibit unauthorized alteration of system data
- ERA13.11 The system shall provide the capability for non-repudiation at the electronic record level
- ERA13.12 The system shall store accessioned electronic records in a non-encrypted state
- ERA13.13 The system shall provide the capability for configurable data access control schemes

ERA13.13.1 The system shall assign access control privileges according to a user's identity

ERA13.13.2 The system shall provide the capability for user group access control

ERA13.13.3 The system shall determine a user's identity through the use of strong authentication technology

ERA13.13.4 The system shall control access to electronic records according to access restrictions

ERA13.13.5 The system shall control access to electronic records according to ownership rights

ERA14 The system shall provide security for itself

ERA14.1 The system shall prevent unauthorized system access

ERA14.2 The system shall provide intrusion deterrence

ERA14.3 The system shall provide intrusion detection

ERA14.3.1 The system shall identify occurrences of attempted intrusions

ERA14.3.2 The system shall identify occurrences of successful intrusions

ERA14.4 The system shall provide data confidentiality of all potentially access restricted information that is exchanged between the system and any other system

ERA14.5 The system shall provide virus detection

ERA14.6 The system shall provide virus elimination

ERA14.7 The system shall operate in accordance with applicable security guidance and rules

ERA14.7.1 The system shall operate in accordance with the Federal Information Security Management Act of 2002 (FISMA)

ERA14.7.2 The system shall operate in accordance with the NARA Policy Directive, NARA 804, Information Technology Systems Security Handbook

ERA14.8 The system shall employ strong authentication techniques when exchanging data with other systems

ERA14.9 The system shall provide the capability for backup of ERA

ERA14.9.1 The system shall provide the capability for the backup of all COTS products files required to re-establish ERA

ERA14.9.2 The system shall provide the capability for the backup of all application files required to rebuild ERA

ERA14.9.3 The system shall provide the capability for the backup of all configuration support files required to rebuild ERA

ERA14.10 The system shall control access to services based on user privileges

ERA14.10.1 The system shall control access to service privileges according to Boolean combinations of group membership

ERA14.11 The system shall control access to records lifecycle data based on a user's access privileges

ERA14.12 The system shall provide the capability to change a user's access privileges

ERA14.13 The system shall provide the capability to associate user privilege sets with sets of electronic records

ERA14.14 The system shall provide the capability to manage access privileges for groups of users

ERA14.14.1 The system shall provide the capability for a user to be a member of multiple groups

ERA14.14.2 The system shall provide the capability to change access privileges for an entire group of users

ERA14.15 The system shall provide the capability for recovery of ERA

ERA14.15.1 The system shall provide the capability to recover all COTS products files required to re-establish ERA

ERA14.15.2 The system shall provide the capability to recover all application files required to re-establish ERA

ERA14.15.3 The system shall provide the capability to recover all configuration support files required to re-establish ERA

Ingest

ERA15 The system shall accept all types of electronic records

ERA15.1 The system shall accept all electronic record types

ERA15.1.1 The system shall accept all data types in which electronic records are written

ERA15.2 The system shall accept electronic records that are composed of more than one digital component

ERA15.2.1 The system shall retain the relationships between the digital components of an electronic record

ERA15.3 The system shall provide the capability to identify the data type of any electronic record

ERA15.4 The system shall provide the capability to identify the data type of any component of an electronic record

ERA16 The system shall provide the capability to transfer electronic records to ERA

ERA16.1 The system shall accept electronic records transferred via physical media

ERA16.1.1 The system shall provide the capability to track the location of transfer media containing electronic records prior to the ingest of the records into ERA

ERA16.2 The system shall provide the capability to accept transfers electronically

ERA16.2.1 The system shall provide the capability for NARA-initiated transfers

ERA16.2.2 The system shall provide the capability for transferring entity initiated transfers

ERA16.3 The system shall confirm the success of the transfer

ERA16.3.1 The system shall check electronic records contained in a transfer

ERA16.3.2 The system shall report discrepancies found with the transfer

ERA16.3.3 The system shall apply Error Detection and Correction (EDAC) technology to transfers

ERA16.4 The system shall use templates to check that the transfer contained what was specified in the disposition agreement

ERA16.4.1 The system shall check that the transfer contains all files identified in the disposition agreement

ERA16.4.2 The system shall check the data type of each file in the transfer

ERA16.5 The system shall use templates to check the archival properties of transferred electronic records

ERA16.5.1 The system shall use templates to check the structure of transferred electronic records

ERA16.5.2 The system shall use templates to check the representation information of transferred electronic records

ERA16.5.3 The system shall use templates to check the arrangement of an aggregate of transferred electronic records

ERA16.6 The system shall provide the capability for inclusion of information about sets of records in a transfer

ERA16.6.1 The system shall provide the capability for inclusion of information about the arrangement of sets of records in a transfer

ERA16.6.2 The system shall provide the capability for inclusion of DOD-STD 5015.2 record profiles for records in a transfer

Access

ERA17 The system shall provide the capability for access review of the assets it contains

ERA17.1 The system shall assist with review determinations

ERA17.1.1 The system shall provide the capability to identify differences in access review determinations applied to copies of the same electronic record

ERA17.1.2 The system shall provide the capability to identify differences in classification applied to copies of the same electronic record

ERA17.1.3 The system shall provide the capability to recognize potentially access restricted assets

ERA17.1.4 The system shall notify the access reviewer of the existence of potentially access restricted electronic records

ERA17.1.5 The system shall provide the capability to assist in determining whether the same electronic records have been released previously

ERA17.1.6 The system shall provide the capability to assist in determining whether the same assets have been released previously

ERA17.1.7 The system shall provide a reference capability containing statutes and guidance relevant to the access review process

ERA17.2 The system shall capture the results of the access review

ERA17.2.1 The system shall capture the review determination

ERA17.2.2 The system shall capture the reason for the review determination

ERA17.2.3 The system shall link the review determination to the affected electronic record

ERA17.3 The system shall produce notifications that additional reviewers need to perform a review

ERA17.4 The system shall provide the capability to change a review determination over time

ERA17.4.1 The system shall display the review determination history of an electronic record upon request

ERA17.5 The system shall provide the capability to declassify assets

ERA17.5.1 The system shall provide the capability to declassify individual records

ERA17.5.2 The system shall provide the capability to declassify sets of records

ERA17.5.3 The system shall capture declassification information

ERA17.6 The system shall manage review determinations

ERA17.6.1 The system shall provide the capability to define new review determinations

ERA17.6.2 The system shall provide the capability to update available review determinations

ERA17.6.3 The system shall provide the capability to delete available review determinations

ERA17.6.4 The system shall provide the capability for a review determination of “fully release”

ERA17.6.5 The system shall provide the capability for a review determination of “partially release”

ERA17.6.6 The system shall provide the capability for a review determination of “redact”

ERA17.6.7 The system shall provide the capability for a review determination of “withhold”

ERA17.6.7.1 The system shall provide the capability to create a placeholder for withheld electronic records indicating reasons for withholding

ERA17.6.8 The system shall provide the capability for a review determination of “withdraw”

ERA18 The system shall provide the capability for redaction of the assets it contains

ERA18.1 The system shall provide the capability for the user to produce redacted versions of the assets it contains

ERA18.1.1 The system shall provide the capability to remove any content from an asset to produce a redacted version of the asset

ERA18.1.2 The system shall provide the capability to replace any content from an asset to produce a redacted version of the asset

ERA18.1.3 The system shall provide the capability to indicate where redaction has occurred

ERA18.2 The system shall manage redacted versions of assets

ERA18.3 The system shall provide the capability to present the redacted version of the assets it contains

ERA18.4 The system shall create a copy of the assets for redaction

ERA18.5 The system shall prohibit redaction of any preservation copy of an electronic record

ERA18.5.1 The system shall prohibit redaction of any electronic record digital component maintained for preservation

ERA18.6 The system shall provide the capability to capture redaction information

ERA18.6.1 The system shall capture the reason(s) for the redaction

ERA18.6.1.1 The system shall provide the capability to link the reasons for redaction to each version of the redaction of an asset

ERA18.6.1.2 The system shall provide the capability to display information concerning the redaction during display of the redacted asset

ERA18.6.2 The system shall capture the identity of the individual who performed a redaction

ERA18.6.3 The system shall capture the date of a redaction

ERA18.7 The system shall provide the capability to redact all assets

ERA18.8 The system shall provide tools for automated redaction of assets

ERA18.9 The system shall provide the capability to display the disposition agreement for the electronic record being redacted

ERA18.10 The system shall provide the capability to identify the redacted versions of assets

ERA19 The system shall provide the capability to search the assets it contains

ERA19.1 The system shall provide the capability for the user to select the characteristics of a search against the assets it contains

ERA19.1.1 The system shall provide the capability for the user to enter the criteria for the search

ERA19.1.2 The system shall provide the capability to search by geographic information

ERA19.1.3 The system shall provide the capability to search by subject

ERA19.1.4 The system shall provide the capability to search by time period

ERA19.1.5 The system shall provide the capability to search by accession number

ERA19.1.6 The system shall provide the capability to search by transferring entity

ERA19.1.7 The system shall provide the capability to search by government function

ERA19.1.8 The system shall provide the capability to search by government line of business

ERA19.1.9 The system shall provide the capability to search by asset type

ERA19.1.10 The system shall provide the capability to search by geospatial identifiers

ERA19.1.11 The system shall provide the capability to search by any element defined in the asset's template

ERA19.1.12 The system shall provide the capability to search by media type

ERA19.1.13 The system shall provide the capability to search by record type

ERA19.1.14 The system shall provide the capability to search descriptions by description unique identifier

ERA19.1.15 The system shall provide the capability to search by title

ERA19.1.16 The system shall provide the capability for keyword searching

- ERA19.1.17 The system shall provide the capability for exact phrase searching
- ERA19.1.18 The system shall provide the capability for concept-based searching
- ERA19.1.19 The system shall provide the capability for Boolean searching
- ERA19.1.20 The system shall provide the capability for proximity searching
- ERA19.1.21 The system shall provide the capability to search based on the frequency of access to assets by other researchers doing similar searches
- ERA19.1.22 The system shall provide the capability for automated question-and-answer searching based on searches performed frequently
- ERA19.1.23 The system shall provide the capability to search only for descriptions that refer to electronic records
- ERA19.1.24 The system shall provide the capability to use wildcard characters in searches
- ERA19.1.25 The system shall provide the capability for searching records lifecycle data
- ERA19.1.26 The system shall provide the capability for searching authority sources for people
- ERA19.1.27 The system shall provide the capability for searching authority sources for organizations
- ERA19.1.28 The system shall provide the capability for the use of designated “stop words” that are disregarded during searches
- ERA19.1.29 The system shall provide the capability to search by transfer
- ERA19.2 The system shall provide the capability to search for assets based on their contents
- ERA19.3 The system shall provide the capability to search through hierarchies of information
 - ERA19.3.1 The system shall provide the capability to navigate from a description to an individual electronic record
 - ERA19.3.2 The system shall provide the capability to navigate from an individual electronic record to an associated description
 - ERA19.3.3 The system shall provide the capability to navigate from a description to a set of electronic records
 - ERA19.3.4 The system shall provide the capability to navigate from a set of electronic records to a description of the set
 - ERA19.3.5 The system shall provide the capability to navigate through all levels of records lifecycle data while searching
 - ERA19.3.6 The system shall provide the capability to navigate through all levels of sets of records while searching
 - ERA19.3.7 The system shall provide the capability to navigate from a description to a description of the description’s creator
- ERA19.4 The system shall provide NARA-created default searches
 - ERA19.4.1 The system shall provide the capability for users to select a NARA default search from among available searches
 - ERA19.4.2 The system shall run the user-selected NARA default search
- ERA19.5 The system shall provide the capability for the user to select the search complexity level, from simple single-variable searches to multi-variable complex searches

- ERA19.6 The system shall provide the capability to control search run times
 - ERA19.6.1 The system shall limit search run times in a pre-emptive manner
 - ERA19.6.2 The system shall provide the capability for users to adjust search run time limits
- ERA19.7 The system shall provide information to the user while the search is in progress
 - ERA19.7.1 The system shall provide a search progress indicator
 - ERA19.7.2 The system shall display the search parameters selected by the user
 - ERA19.7.3 The system shall provide an estimate to the user of how long the search will take to execute
 - ERA19.7.4 The system shall notify the user when the search is complete
- ERA19.8 The system shall present the search results set to the user
 - ERA19.8.1 The system shall display a search results set that includes all assets meeting the search criteria
 - ERA19.8.2 The system shall display an explanation for the reason for withholding assets
 - ERA19.8.3 The system shall exclude from display assets whose existence cannot be disclosed to the requesting user
 - ERA19.8.4 The system shall display the total number of results in the result set returned by the search
 - ERA19.8.5 The system shall provide the capability for the user to select the quantity of search results to be presented in the results set
 - ERA19.8.6 The system shall provide the capability for users to select the order in which the result set is presented
 - ERA19.8.7 The system shall provide the capability to rank the results of the search by relevance
 - ERA19.8.8 The system shall present the search results set at user-selectable levels of detail
 - ERA19.8.9 The system shall indicate different versions of a record included in the search result set
- ERA19.9 The system shall provide the capability for a user to refine a search
 - ERA19.9.1 The system shall provide the capability to search within the result set returned by the initial search
 - ERA19.9.1.1 The system shall provide a “more like this” capability to refine a search for more assets similar to those returned by the search
 - ERA19.9.1.2 The system shall provide the capability to refine a search using any search criteria available in the system
 - ERA19.9.2 The system shall provide the capability to stop a search in progress in order to refine the search
- ERA19.10 The system shall provide the capability for the user to select the assets they wish to access from among the search results set
- ERA19.11 The system shall provide the capability to save a search
 - ERA19.11.1 The system shall provide the capability for the user to select a saved search from their saved searches
 - ERA19.11.2 The system shall provide the capability to run saved searches
- ERA19.12 The system shall provide the capability for users to store results sets over time

- ERA19.12.1 The system shall provide the capability to store search results
- ERA19.12.2 The system shall provide the capability to save selected portions of results sets
- ERA19.12.3 The system shall maintain a search results set for a specified period of time
- ERA19.13 The system shall manage mediated searches
 - ERA19.13.1 The system shall provide the capability to request a mediated search
 - ERA19.13.2 The system shall provide the capability for mediated searchers to dialog with search requestors about their mediated search
 - ERA19.13.3 The system shall provide the capability to manage mediated search request responses
 - ERA19.13.4 The system shall provide the capability to prioritize mediated searches

ERA20 The system shall provide access to the assets it contains

- ERA20.1 The system shall provide the capability to electronically present all electronic record types
- ERA20.2 The system shall provide the capability for users to request copies of assets
- ERA20.3 The system shall provide the capability to output copies of all assets
 - ERA20.3.1 The system shall provide the capability to output all assets to media
 - ERA20.3.1.1 The system shall print address labels for media orders
 - ERA20.3.1.2 The system shall print packing lists for media orders
 - ERA20.3.2 The system provide the capability to print all printable assets
- ERA20.4 The system shall provide access to electronic records independently of the hardware with which they were created
 - ERA20.4.1 The system shall provide the capability to output assets independently of the hardware with which they were created
 - ERA20.4.2 The system shall provide the capability to electronically present assets independently of the hardware with which they were created
- ERA20.5 The system shall provide access to electronic records independently of the software with which they were created
 - ERA20.5.1 The system shall provide the capability to output assets independently of the software with which they were created
 - ERA20.5.2 The system shall provide the capability to electronically present assets independently of the software with which they were created
- ERA20.6 The system shall provide the capability to access an entire electronic record
- ERA20.7 The system shall provide the capability to access a set of electronic records
- ERA20.8 The system shall provide the capability to access a portion of an electronic record
- ERA20.9 The system shall provide the capability to access all digital components of an electronic record
- ERA20.10 The system shall provide the capability to output assets in formats selected by the user from available choices
 - ERA20.10.1 The system shall provide the capability for users to select the output format of selected assets from among available formats

- ERA20.10.2 The system shall output certified copies of electronic records in formats selectable by the user from available choices
- ERA20.10.3 The system shall output certified copies of electronic records on media selectable by the user from available choices
- ERA20.10.4 The system shall provide the capability to output selected asset formats via telecommunications
- ERA20.11 The system shall maintain the authenticity of an electronic record during access
 - ERA20.11.1 The system shall maintain electronic record content during access
 - ERA20.11.2 The system shall maintain electronic record specified behavior during access
 - ERA20.11.3 The system shall maintain electronic record context during access
 - ERA20.11.4 The system shall maintain electronic record structure during access
 - ERA20.11.5 The system shall maintain electronic record presentation during access
 - ERA20.11.6 The system shall provide the capability to present digital components of electronic records individually
 - ERA20.11.7 The system shall provide the capability to output digital components of electronic records individually
 - ERA20.11.8 The system shall provide the capability to present electronic records composed of multiple digital components
 - ERA20.11.9 The system shall provide the capability to output electronic records composed of multiple digital components

User Interface

ERA21 The system shall provide a user interface

- ERA21.1 The system shall provide default workbenches tailored to users' roles
 - ERA21.1.1 The system shall display the appropriate default workbench based on a user's registration information
- ERA21.2 The system shall provide the capability for users to customize their workbenches
 - ERA21.2.1 The system shall provide the capability for users to customize their user workbench by adding tools to the default workbench
 - ERA21.2.2 The system shall provide the capability for users to customize their user workbench by removing tools from the default workbench
 - ERA21.2.3 The system shall provide the capability for users to customize the appearance of their workbench
 - ERA21.2.4 The system shall remember the most recent customization to a user's workbench as that user's default workbench
- ERA21.3 The system shall provide the capability for users to select among available workbenches
- ERA21.4 The system shall maintain workbench configuration across user sessions
- ERA21.5 The system shall provide the capability for configurable user interfaces

ERA21.6 The system shall provide the capability for foreign language extensibility such that the user interface could contain foreign language text in the future without major redesign

ERA21.7 The system shall provide a user interface capable of electronically presenting all supported types of electronic records

ERA21.8 The system shall accept input of information by users

ERA21.8.1 The system shall check information entered by users

Administration

ERA22 The system shall provide the capability for user registration

ERA22.1 The system shall provide the capability to register users

ERA22.1.1 The system shall register user types

ERA22.1.2 The system shall associate registered users with user groups

ERA22.1.3 The system shall establish a user account for each registered user

ERA22.2 The system shall collect information from the user during registration

ERA22.2.1 The system shall collect name from the user during registration

ERA22.2.2 The system shall collect contact information from the user during registration

ERA22.2.3 The system shall collect security clearance information from the user during registration

ERA22.2.4 The system shall collect information on whether the user is a stakeholder in an equity holder from the user during registration

ERA22.2.5 The system shall collect job role information from the user during registration

ERA22.2.6 The system shall collect proof of identity information from the user during registration

ERA22.2.7 The system shall collect information identifying the individual being registered as a transferring entity during registration

ERA22.2.8 The system shall provide the capability for NARA users to determine what information is collected during registration

ERA22.3 The system shall manage user accounts

ERA22.3.1 The system shall provide the capability to create user accounts

ERA22.3.1.1 The system shall provide the capability to create user accounts automatically

ERA22.3.2 The system shall provide the capability to access user accounts

ERA22.3.3 The system shall provide the capability to update user accounts

ERA22.3.4 The system shall provide the capability to delete user accounts

ERA22.3.5 The system shall provide the capability to suspend user accounts

ERA22.3.6 The system shall provide the capability to reactivate suspended user accounts

ERA22.3.7 The system shall provide the capability for the renewal of user registrations

ERA22.3.8 The system shall expire user accounts

ERA22.3.9 The system shall provide the capability for users to cancel their accounts

ERA22.3.10 The system shall provide the capability for users to update their account information

ERA23 The system shall provide user assistance

ERA23.1 The system shall manage user assistance

ERA23.1.1 The system shall provide the capability to create user assistance functions

ERA23.1.2 The system shall provide the capability to access user assistance functions

ERA23.1.3 The system shall provide the capability to update user assistance functions

ERA23.1.4 The system shall provide the capability to delete user assistance functions

ERA23.2 The system shall provide help screens

ERA23.3 The system shall provide help desk support functions

ERA23.4 The system shall provide the capability for user training

ERA23.4.1 The system shall provide the capability for simulated user sessions

ERA23.4.2 The system shall provide the capability for simulated administrator sessions

ERA23.5 The system shall provide the capability to link to NARA resources from within ERA

ERA23.6 The system shall provide the capability to define specific user assistance products to specific groups of users

ERA23.7 The system shall provide the capability to guide users through the steps of an ERA process step-by-step

ERA23.8 The system shall provide the capability for users to initiate a message to NARA staff member(s) requesting assistance

ERA24 The system shall provide the capability for communications with users

ERA24.1 The system shall manage communications

ERA24.1.1 The system shall provide the capability to receive communications

ERA24.1.2 The system shall provide the capability to track communications

ERA24.1.3 The system shall provide the capability to categorize communications

ERA24.1.4 The system shall provide the capability to respond to communications

ERA24.1.5 The system shall provide the capability to prioritize communications

ERA24.2 The system shall provide the capability for dialoguing between NARA and users

ERA24.3 The system shall notify users of system events

ERA24.3.1 The system shall provide the capability to notify users about scheduled system maintenance

ERA24.3.2 The system shall provide the capability to notify users about delayed response time

ERA24.3.3 The system shall notify users when system services are affected by system events

ERA24.3.4 The system shall notify users when system resources are affected by system events

ERA24.4 The system shall provide the capability to generate notices for other systems

ERA24.5 The system shall generate notices to users

ERA24.5.1 The system shall provide the capability to notify a transferring entity of the results of system events

ERA24.5.2 The system shall provide the capability to notify a list of users regarding system events

ERA24.5.3 The system shall provide the capability to notify users about the progress of system events

ERA24.5.4 The system shall notify users when they have been denied access to materials

ERA24.5.5 The system shall provide the capability to notify users of upcoming events

ERA24.6 The system shall provide the ability for users to manage notices

ERA24.6.1 The system shall provide the capability to manage standard language notices

ERA24.6.2 The system shall provide the capability to manage ad hoc notices

ERA24.6.3 The system shall provide the capability for users to create notices

ERA24.6.4 The system shall provide the capability for users to save notices

ERA24.6.5 The system shall provide the capability for users to edit notices

ERA24.6.6 The system shall provide the capability for users to delete notices

ERA24.6.7 The system shall provide the capability for users to specify recipients of notices

ERA24.6.8 The system shall provide the capability for users to send notices

ERA25 The system shall maintain an event log

ERA25.1 The system shall provide the capability to log all system events

ERA25.2 The system shall provide the capability for NARA to select which information to log in the event log

ERA25.3 The system shall provide the capability for NARA to define categories of event log information

ERA25.4 The system shall provide the capability for NARA to define the retention period for categories of event log information

ERA25.4.1 The system shall provide the capability to archive event log information

ERA25.5 The system shall make event log information available upon request

ERA25.5.1 The system shall be capable of providing event log information for specific electronic records

ERA25.6 The system shall provide the capability to completely expunge event log information

ERA25.6.1 The system shall provide the capability to completely expunge event log information pertaining to an individual electronic record from the event log

ERA25.6.2 The system shall provide the capability to completely expunge event log information pertaining to sets of electronic records from the event log

ERA25.7 The system shall manage the electronic records created by itself

ERA25.7.1 The system shall provide the capability to maintain records related to any records lifecycle transaction

ERA26 The system shall provide reporting capability

ERA26.1 The system shall provide the capability to manage reports

ERA26.1.1 The system shall provide the capability to create reports

ERA26.1.1.1 The system shall provide the capability to automatically create routine reports

ERA26.1.2 The system shall provide the capability to modify reports

ERA26.1.3 The system shall provide the capability to save reports

ERA26.1.3.1 The system shall provide the capability to save a report to a file

ERA26.1.4 The system shall provide the capability to delete reports

ERA26.1.5 The system shall provide the capability to display reports

ERA26.1.6 The system shall provide the capability to print reports

ERA26.2 The system shall provide the capability to select reports

ERA26.3 The system shall provide the capability to select report contents

ERA26.3.1 The system shall provide the capability to include any log event in a report

ERA26.3.2 The system shall provide the capability to include the results of any system service in a report

ERA26.3.3 The system shall provide the capability to include electronic records in a report

ERA26.3.4 The system shall provide the capability to combine report contents

ERA26.3.5 The system shall provide the capability to customize report formats

ERA26.3.6 The system shall provide the capability to graphically represent report results

ERA26.3.7 The system shall provide the capability to present report results in tables

ERA26.4 The system shall provide the capability to output report results

ERA26.4.1 The system shall provide the capability to output reports to media

ERA26.4.2 The system shall provide the capability to present reports via the user interface

ERA26.4.3 The system shall provide the capability to output reports to other systems

ERA26.5 The system shall provide the capability to make reports available to other users

ERA27 The system shall provide systems administration capabilities

ERA27.1 The system shall provide tools to support system level testing

ERA27.1.1 The system shall provide the capability to designate test data

ERA27.1.2 The system shall provide the capability for complete deletion of test data from the system without affecting other data

ERA27.1.3 The system shall provide the capability to track designated test data throughout the system

ERA27.1.4 The system shall provide the capability to completely delete system artifacts resulting from testing from the system without affecting other data

ERA27.1.5 The system shall provide the capability for monitoring during testing

ERA27.2 The system shall manage system failures

ERA27.2.1 The system shall identify failures

- ERA27.2.2 The system shall isolate failures
- ERA27.2.3 The system shall resolve failures
- ERA27.2.4 The system shall provide notification of failures
- ERA27.2.5 The system shall provide consolidated application error logging
- ERA27.2.6 The system shall provide consolidated COTS fault logging
- ERA27.3 The system shall monitor overall system state in a consolidated manner
 - ERA27.3.1 The system shall monitor system workflow
 - ERA27.3.2 The system shall monitor system load
 - ERA27.3.3 The system shall monitor system performance
 - ERA27.3.4 The system shall monitor storage usage
 - ERA27.3.5 The system shall monitor data requests
 - ERA27.3.6 The system shall monitor the status of all its storage systems
 - ERA27.3.7 The system shall monitor the performance of all its storage systems
 - ERA27.3.8 The system shall present system monitoring data via a consistent operations user interface
- ERA27.4 The system shall provide the capability to adjust system parameters
 - ERA27.4.1 The system shall adjust storage allocations
 - ERA27.4.2 The system shall balance system loads
 - ERA27.4.3 The system shall allocate resources
 - ERA27.4.4 The system shall de-allocate resources
 - ERA27.4.5 The system shall report resources usage
 - ERA27.4.6 The system shall provide the capability to take resources off line
 - ERA27.4.7 The system shall provide the capability to bring resources on line
 - ERA27.4.8 The system shall present the system parameter controls via a consistent operations user interface

ERA28 The system shall provide logistics management capabilities

- ERA28.1 The system shall provide inventory management
 - ERA28.1.1 The system shall provide spare parts inventory management
 - ERA28.1.1.1 The system shall provide the capability to monitor the spare parts inventory
 - ERA28.1.1.2 The system shall provide the capability to manage the replenishment of the spare parts inventory
 - ERA28.1.2 The system shall provide consumables inventory management
 - ERA28.1.2.1 The system shall provide the capability to monitor all the consumables inventories for ERA operations
 - ERA28.1.2.2 The system shall provide the capability to manage the replenishment of the consumables inventories
 - ERA28.1.3 The system shall provide the capability to manage a system-wide inventory of all hardware contained within ERA
 - ERA28.1.4 The system shall provide the capability to manage a system-wide inventory of all software contained within ERA
- ERA28.2 The system shall provide configuration management capabilities

ERA28.2.1 The system shall provide the capability for configuration management of the operational hardware of ERA

ERA28.2.2 The system shall provide the capability for configuration management of the archival software of ERA

ERA28.2.3 The system shall provide the capability for configuration management of the system software of ERA

ERA28.2.4 The system shall provide the capability to migrate hardware upgrades into the operational environment

ERA28.2.5 The system shall provide the capability to migrate software upgrades into the operational environment

ERA28.2.6 The system shall provide configuration management to support the testing of ERA

ERA28.3 The system shall provide the capability to schedule preventative maintenance for system components

System Characteristics

ERA29 The system shall manage user subscriptions to services

ERA29.1 The system shall provide the capability to manage user subscriptions

ERA29.1.1 The system shall provide the capability for the user to create subscriptions

ERA29.1.2 The system shall provide the capability for the user to modify subscriptions

ERA29.1.3 The system shall provide the capability for the user to delete subscriptions

ERA29.1.4 The system shall provide the capability for the user to suspend subscriptions

ERA29.1.5 The system shall provide the capability for the user to resume suspended subscriptions

ERA29.1.6 The system shall provide the capability for the System Administrator to execute all subscription management functions on behalf of the user

ERA29.2 The system shall provide the capability to manage subscription processing independently of other system performance functions

ERA29.3 The system shall provide the capability to execute any combination of services in response to any combination of events

ERA29.3.1 The system shall provide the capability for any service to be eligible for subscription

ERA29.3.2 The system shall provide the capability for any system event to be eligible for subscription

ERA29.4 The system shall provide the capability to execute a subscription a specified number of times

ERA29.4.1 The system shall provide the capability for the user to specify the number of times a subscription is to be executed

ERA29.4.2 The system shall delete subscriptions after they have been run the number of times specified by the user

ERA29.5 The system shall provide the capability for subscriptions that are time based

ERA29.5.1 The system shall provide the capability to execute subscriptions at a specified future time

ERA29.5.2 The system shall provide the capability to execute subscriptions at specified intervals

ERA30 The system shall provide service management

ERA30.1 The system shall provide the capability to queue services

ERA30.2 The system shall provide the capability to monitor services

ERA30.3 The system shall provide the capability to categorize services

ERA30.4 The system shall provide the capability to prioritize services

ERA30.4.1 The system shall provide the capability to prioritize different categories of services

ERA30.4.2 The system shall provide the capability to prioritize individual service executions within a category of service

ERA30.5 The system shall provide the capability to preempt services

ERA30.6 The system shall provide the capability to suspend services

ERA30.6.1 The system shall provide the capability to suspend a service at the category level

ERA30.6.2 The system shall provide the capability to suspend an individual service's execution within a category of service

ERA30.6.3 The system shall provide the capability to resume any type of service that has been suspended

ERA30.7 The system shall provide the capability to limit service execution times

ERA30.7.1 The system shall limit individual service execution run times in a pre-emptive manner

ERA30.7.2 The system shall provide the capability to adjust service execution run time limits

ERA30.8 The system shall provide check-pointing

ERA30.8.1 The system shall store check-pointed system state information sufficient for full system state recovery

ERA30.8.2 The system shall provide the capability to recover from a check-pointed point in time

ERA30.9 The system shall provide the capability for all services to be eligible for fee bearing status

ERA30.9.1 The system shall interface with external billing systems

ERA30.10 The system shall estimate resource requirements for any ERA-provided service

ERA30.11 The system shall estimate execution time for any service

ERA30.12 The system shall provide APIs for all developed services

ERA31 The system shall meet or exceed specified performance requirements

ERA31.1 The system shall accommodate loads as specified in **Appendix B, Table B-2, ERA Record Volume Requirements**

ERA31.2 The system shall be scalable to one exabyte of total storage without major design changes

ERA31.3 The system shall be scalable to ten teraobjects without major design changes

ERA31.4 The system shall provide response time performance as specified in **Appendix B, Table B-3, ERA System Performance Requirements**

ERA32 The system shall meet or exceed specified availability requirements

ERA32.1 The system shall meet or exceed availability requirements as specified in **Appendix B, Table B-1, ERA Availability Requirements**

ERA32.2 The system shall have no single point of failure

ERA33 The system shall be designed in the context of NARA's Enterprise Architecture

ERA33.1 The system shall comply with section 508 of the Rehabilitation Act of 1973

Appendix A: Glossary of Terms

Term	Definition
Access	<p>To make available (in accordance with all applicable access restrictions) records, copies of records or information about records through activities such as reference services, providing reproductions, and producing exhibitions and public programs.</p> <p>See also “Output a Record” and “Present Electronically” for the ways in which ERA provides access to records.</p>
Access Restriction	<p>An identified restriction that controls how access can be provided to assets, and how assets can be stored. Restrictions may apply to all or part of the asset, and may be based on national security considerations, donor restrictions, court orders, Freedom of Information Act (FOIA) exemptions, or other statutory or regulatory provisions.</p> <p>Note: Restrictions may be either mandatory (information must be withheld) or discretionary (information may be withheld). Restrictions apply both to classes of users who may, or may not, receive the restricted material, as well as to the restricted material and to the information that is restricted. There may be conditions, such as lapse of time, purpose of disclosure, or consent of a subject individual, which allow restricted information to be released.</p>
Access Review	<p>The process of reviewing records to determine what records or parts of records must be withheld from a requestor because of access restrictions, and the process of implementing those decisions to release, redact, withdraw, or withhold materials. This includes systematic review, mandatory review, FOIA review, special access review, and review of records of concern.</p>

Term	Definition
Accession	<p>As a verb, the processes supporting the transfer of legal custody of records to NARA from the creator (or the creator's legal representative, successor, or heir), including the generation, execution, and processing of deeds of gift, the standard forms, or other appropriate legal documents.</p> <p>As a noun, the body of records for which legal custody is transferred by one act of accessioning.</p> <p>Note: Accession should not be confused with Transfer (which involves the movement of records from the transferring entity to NARA) or Ingest (which involves bringing records into the ERA system).</p>
Appraisal	The process of determining the value and thus the disposition of records based upon their current administrative, legal, and fiscal use; their evidential and informational value; their arrangement and condition; their intrinsic value; and their relationship to other records.
Archival Description	See Description.
Archival Processing	The activities of accessioning, arranging, describing, conducting access review, and properly storing records.
Arrangement	<p>The intellectual and physical processes and the results of organizing records in accordance with accepted archival principals.</p> <p>Note: For the purposes of the ERA system, arrangements do not dictate the physical order in which electronic records are stored by the system. The system must be able to present or output arrangements of records when the records are accessed.</p>
Assets	The complete set of information available within ERA.
Attribute of Records	A data item containing a single piece of information about a record.
Audit Trail	Information stored in the system log that provides the capability to discover an action or series of actions taken by the system, including actions initiated by either the system or by an individual interacting with the system.

Term	Definition
Authentic Copy	A copy of a record for which the official custodian attests the authenticity. Note, for the purposes of this RD, an electronic copy of an authentic electronic record is itself authentic if attested to be so by the official preserver. Such attestation is supported by the preserver's ability to demonstrate that it has satisfied all the basic requirements for the production of authentic copies. By virtue of this attestation, the copy is deemed to conform to the record it reproduces until proof to the contrary is shown.
Authentically Preserve	To maintain a record over time in such a manner that its identity is unquestionable and it is not corrupted.
Authenticity	The property of a record that it is what it purports to be and has not been corrupted.
Authority Source	A list, file, pick list, or thesaurus containing standardized information (e.g., acronyms, abbreviations, names, and phrases) which are used to ensure that a person, place, thing, event, or concept is consistently referred to using the same terminology, so providing a uniform method of creating consistent indexes or access points to records and information about records.
Availability	The ratio of time that a system is available to the total time of system operation. As availability is a statistical calculation, mean times are used.
Certified Copy	A copy of a record signed and certified as an authentic copy by the official custodian of the original.
Check Pointing	Periodic recording of the state of the system, usually for purposes of being able to roll the system back to the state it was in prior to a problem.
Content of a Record	The information conveyed by the record.
Context of a Record	The organizational, functional, and operational circumstances in which a record is created and/or received and used.
Copy	A duplicate or reproduction. A copy of a record may be an identical copy that has the same content, structure, and presentation as the original; a version that has some variation from the original in content, structure, or presentation; or an extract, which includes only part of the original.
Creator	The organization or person responsible for the creation, accumulation, or maintenance of a series of records when in working (primary) use.

Term	Definition
Custody	Guardianship, or control, of records, including both physical possession (physical custody) and legal responsibility (legal custody), unless one or the other is specified.
Data File	<p>1) A collection of data that is stored together and treated as a unit by a computer.</p> <p>2) Related data (numeric, textual, or graphic information) and fields that are organized in a strictly prescribed form and format.</p>
Data Type	The representation of information according to preset specifications (e.g., plain text files, fixed length text files, HTML, TIFF, etc.).
Deed of Gift	A type of disposition agreement in which records are donated (and legal custody transferred) to NARA by an individual, family, or organization.
Deposit Agreement	<p>A type of disposition agreement in which NARA agrees to accept physical custody of records without taking legal custody of them.</p> <p>Note: Such agreements are unusual, and are not applicable for material over which NARA has statutory authority, i.e. Federal and Presidential records.</p>
Description	<p>1) The process of analyzing, organizing, and recording information that serves to identify, manage, locate, and explain records, and the contexts and record systems from which the records were selected. See also Hierarchical Description.</p> <p>2) The written representation or products of the above process.</p>
Destruction	The process of eliminating or deleting records beyond any possible reconstruction.
Digital Component of a Record	A bit stream which is necessary to reproduce an electronic record and requires specific identification because it is stored separately or in a specific data type, or has a specific behavior or association with specific software.
Dispose	To carry out disposition instructions to destroy or donate temporary records after their retention period expires or other records without permanent value.

Term	Definition
Disposition	<p>Those actions taken regarding records no longer needed for the conduct of the regular current business of the originator.</p> <p>Note: These actions include transfer to storage facilities or records centers, transfers from one creator to another, transfer of physical custody to NARA, transfer of legal custody to NARA, and disposal.</p>
Disposition Agreement	A general term that includes all types of agreements (records schedules, deeds of gift, deposit agreements) that contain disposition instructions.
Disposition Instruction	<p>The instructions contained in a disposition agreement that mandate what is to be done with records at certain points in their lifecycle. Disposition Instructions may consist of:</p> <ul style="list-style-type: none"> • Specification of the length of time records should be retained by their creator or custodian (the “retention period”), • Conditions under which the creator or custodian should terminate retention, • Physical or legal transfer of records to another custodian, and • Destruction of records, or stipulation that the records are not to be destroyed.
Donated Material	Records that have been transferred into NARA’s legal custody via a deed of gift from a person or non-Federal organization.
Electronic Record	A record in a form that only a computer can process.
Equity Holder	<p>A Federal or Presidential organization that owns or has a stake in information found in a record, and so has must participate in decisions relating to the release, redaction, and withdrawal of records during access review.</p> <p>Note: Equity holders may be involved in the redaction of records, as well as decisions regarding whether to release access restricted records in which they have an interest. The equity holder may have classified information in a record, whether or not it created the record. Without declassification guidelines, only the equity holder can declassify information in a record.</p>
Essential Characteristics	Those properties/characteristics of electronic records that must remain unchanged through transfer, ingest, storage, and presentation or output of records.

Term	Definition
Event Log	The recording of activities performed by ERA for the purpose of providing audit trails, accountability information, and the recreation of events.
Export - Media	Controlled removal of media from ERA archival assets.
Export - Record	To remove a record from ERA and provide it to another system or user. The exported record no longer exists in ERA at the conclusion of an export. Export may or may not include the records lifecycle data pertaining to the exported record.
Expunge Record	Complete removal of a record and all related information such that no trace of the record's existence or its audit trail information remains in the system.
Fee Bearing Service	An ERA capability for which a fee may be charged.
File Unit	The middle level of hierarchical description as defined by NARA, which describes an organized unit of records grouped together either for current use or in the process of archival arrangement. A file unit is the intellectual grouping of the records, which may or may not equal the physical grouping. For example, a case file may be housed in several physical folders, but described as one file unit.
Final Operating Capability (FOC)	The complete set of ERA capabilities when the system is fully deployed and fully operational.
Foreign Language Extensibility	Designing the ERA system such that it may be enhanced to accommodate foreign (non-English) languages if needed without major rework to the system.
Freedom of Information Act (FOIA) Request	A request, made based on the provisions of the Freedom of Information Act, for access to restricted information in Federal records held by NARA, including NARA operating records subject to the FOIA, or for access to Presidential records in the custody of NARA that were created after January 19, 1981 and are subject to the Presidential Records Act.
Hierarchical Description	The principal of archival description in which records are described in aggregates at various prescribed hierarchical levels. At NARA these levels range from the largest grouping (series) to the intermediate level (file unit) to the smallest (item). Descriptions of records at the series level are also linked to one of two types of archival control groups: a record group or a collection.
Ingest	The process of moving records into the ERA system.
Initial Operating Capability (IOC)	The set of ERA capabilities available for use upon completion of the initial deployment of ERA.

Term	Definition
Item	The lowest level of hierarchical description as defined by NARA, which describes the smallest intellectually indivisible archival unit (e.g. a letter, memorandum, report, leaflet, or photograph).
Legal Custody	To have legal control and responsibility for a specific group of records.
Location Transparent Access (to assets)	A user, or a component of the system, will not need to know the location of a record within ERA in order to access that record. A search capability will locate requested records based on entered search criteria.
Media Migration	The act of moving electronic records and related data from one piece of media to another, usually in response to improving media technology, to avoid the inability to access records on media that is becoming obsolete, or to move records from media that is deteriorating onto fresh media.
Mediated Search	A search for records or information about records during which the person searching is assisted by NARA personnel.
Medium	The physical material in or on which information may be recorded (e.g. paper, magnetic tape, film). Note: For the purposes of this RD, Medium is the physical material on which the information constituting electronic records reside (e.g., magnetic disk, magnetic tape, CD, etc.).
Model Template	A template created to be copied and modified for the creation of new templates.
Non-repudiation	Steps taken to ensure that the sender of a message or initiator of an activity cannot deny being the source of the message or the initiator of the activity.
Notice	For the purposes of this RD, any communication originating from ERA to a user or group of users of the system. Notices may inform users of scheduled system downtime, the availability of search results, or other information that needs to be conveyed to users.
Original Order	The arrangement of records established by the creator, preserved by NARA in order to preserve existing relationships, evidential significance, and the usefulness of finding aids supplied by the creator.
Output a Record	A means of making a record available outside of the system, such as copying files to digital media, printing records to paper, or transmitting copies over the internet. The record in ERA archival storage is not affected by being output.

Term	Definition
Permanent Record	A record that has sufficient historical or other value to warrant its continued preservation by the Federal Government beyond the time it is needed for administrative, legal, or fiscal purposes.
Persistent Format	A data type, which may be simple or complex, that is independent of specific hardware or software, such that an object in this data type can be transferred from a source platform to an arbitrary target platform with no significant alteration of essential attributes or behaviors.
Physical Custody	To have physical control of and responsibility for a specific group of records.
Present Electronically	The act of reproducing records on an electronic device, as opposed to producing hard copies, printing text or images to paper, or writing records to media. The records in ERA archival storage are not affected by being presented electronically.
Preservation	Processes and operations involved in ensuring the technical and intellectual survival of authentic records through time.
Preservation and Access Level (PAL)	The related services for preservation and access to a set of electronic records maintained in the ERA system. NARA will specify standard PALs for given record types and data types.
Preservation and Access Plan	A plan, based on the results of a preservation assessment, indicating the activities to be undertaken in preserving specific records or sets of records, and how NARA will provide access them.
Preservation Assessment	1) The review of records to determine the records' current condition and potential need for preservation processing. 2) The results of this review.
Preservation Copy	A copy of a record used solely in the processes and operations involved in the stabilization and protection of the record against damage or deterioration.
Preservation Process	A process appropriate for ensuring the continued existence, accessibility, and authenticity of records over time.

Term	Definition
Provenance	<p>The organization or individual that created, accumulated, or maintained the records in the conduct of business, and/or maintained records in the conduct of business prior to their transfer to NARA.</p> <p>Note: The archival principle of provenance states that records of the same provenance must not be intermingled with those of any other provenance. For the purposes of this RD, this is not to be construed as placing any limitations on how records may be sequenced or segregated on storage media.</p>
Record	A unit of recorded information of any type that is made or received in the course of activity and is kept because it provides evidence of the activity, is required by law or regulation, or contains valuable information.
Record Behavior	For the purposes of this RD, the ability of a record presented or output by ERA to do essentially the same things it could do when in use by the transferring entity. See also “Specified Behavior”.
Record Creator	See Creator.
Record Group	An administrative grouping of organizationally related records established by an archival agency after considering the organization’s administrative history and complexity and the volume of its records.
Record Presentation	The process or the result of a process, of transforming an electronic record from a digital storage format into a form in which it can convey to a human the information it was intended to communicate.
Record Type	The intellectual form of the records, such as letter, memo, greeting card, or portrait.
Records Center	A facility for the storage and servicing of records pending their disposal or transfer to the National Archives. Records centers include NARA-authorized agency records centers and NARA-operated Federal records centers.
Records Lifecycle	An archival concept that describes the lifespan of a record, from its creation or receipt to its final disposition. The records lifecycle is divided into the following stages or phases: creation/receipt, maintenance and use, retirement, final disposition, and continuing use.

Term	Definition
Records Lifecycle Data	All data collected by NARA that pertains to the records throughout their lifecycle. This includes all data related to records lifecycle management processes, including data collected during scheduling, physical transfer, legal transfer, and description.
Records Lifecycle Transaction	Activity performed on records throughout their existence that changes their status in the records lifecycle. Such transactions include the scheduling and appraisal of government records, the development of deposit agreements, the retirement of records to NARA's physical custody, the transfer of permanent records to the National Archives and Presidential Libraries, destruction, and the review, redaction, and release of information subject to legal restrictions on access. Making a copy of a record is not a lifecycle transaction, because it does not change the status of the record being copied.
Records Schedule	<p>A type of disposition agreement developed by a Federal agency and approved by NARA that describes Federal records, establishes a period for their retention by the agency, and provides mandatory instructions for what to do with them when they are no longer needed for current Government business. The term refers to: (1) an SF 115, Request for Records Disposition Authority, that has been approved by NARA to authorize the disposition of Federal records; and (2) a General Records Schedule (GRS) issued by NARA.</p> <p>Note: Records schedules may be reproduced or referenced in a printed agency manual or directive containing the records' descriptions and disposition instructions approved by NARA on one or more SF 115s or issued by NARA in the GRS.</p> <p>Also called records disposition schedule, records control schedule, records retention schedule, records retention and disposition schedule, or schedule.</p>
Redaction	The action of following instructions and/or guidelines from equity holders to create a copy of records, in which access restricted information is removed so that the non-restricted information in the record may be made available to the public.
Registration of a Template	Official approval of a template by NARA, and placement of the template in the ERA template repository. Once registered, the template can be used.

Term	Definition
Release <ul style="list-style-type: none"> ▪ Full Release ▪ Partial Release 	A review determination that the record may be accessed by the public, either in full or in part. Full release indicates that the entire record is available for access. Partial release indicates that some information within the record has been withheld by performing redaction, or that a subset of records in a group of records has been withheld.
Remove Record	To remove a record from the system but maintains its audit trail or other information about it.
Representation Information	Information accompanying a digital object, or sequence of bits, that is used to provide additional meaning. It typically maps the bits into commonly recognized data types such as character, integer, and real, and into groups of these data types. It associates these with higher-level meanings that can have complex inter-relationships that are also described.
Retrieval of Records	The process of locating records, getting them from storage, and preparing them for presentation or output.
Review Determination	The decision in an access review as to whether records will be fully released, partially released, redacted, withdrawn, or withheld.
Sample Records	Copies of a representative group of records provided by the creator or a custodian to NARA to support the review of a proposed disposition agreement, an inspection or evaluation of the agency's records management program, or the identification of preservation requirements.
Schedule	<p>As a verb, the processes carried out by a Federal agency to support the development of a records schedule.</p> <p>As a noun, a synonym for records schedule.</p>
Self-Describing	An entity whose data structure, format, or layout provides both definitions and values for the data or formats of the entity. A self-describing entity can be evaluated, with all its elements and formats understood, without the need of external references.
Series	The highest level of hierarchical description as defined by NARA, which describes file units or items arranged in accordance with a filing system or maintained as a unit because they result from the same accumulation or filing process, the same function, or the same activity; have a particular form; or because of some other relationship arising out of their creation, receipt, or use.
Set of Records	Records grouped together, either physically or virtually, for any purpose. Sets may be hierarchical in nature.

Term	Definition
Specified Behavior	Behavior of a record that has been specified in advance of preservation by ERA to be of sufficient importance that it must be maintained through preservation and be available when the record is output or presented. See also “Record Behavior”.
Standard Language Notice	A notice that is expected to be reused, as opposed to a one-time notice.
Structure	The physical or logical form of a record or a record set.
Subscription	For the purposes of this RD, a standing instruction stipulating a specific action to be taken by the system on behalf of the user at the occurrence of a trigger event.
System	Includes all of the associated equipment, facilities, material, software, hardware, policy, technical documentation, services, and personnel required for operations and support at NARA.
Template	<p>A set of specifications about a type of record or a set of records.</p> <p>Note: For the purposes of this RD, the system will apply templates to ensure the preservation of authentic records; to ensure that lifecycle transactions are correctly executed; and to facilitate access to the records.</p>
Temporary Record	A record approved by the appropriate authority for disposal, either immediately or after a specified retention period.
Transfer	<p>As a verb, the processes supporting the moving of records from one location to another. Usually used to refer to transfer of records from the creator or custodian to NARA (including Federal records centers).</p> <p>As a noun, the body of records for which physical custody is so transferred.</p> <p>Note: For the purposes of this RD, as a verb, transfer refers to the actions surrounding the movement of records into ERA from the transferring entity. Transfers may consist of File Transfer Protocol (FTP), receiving and loading records from media, or other transfer methods approved by NARA.</p>
Transferring Entity	The individual, organization, Presidential administration, or Federal agency that transfers records to NARA for storage. The transferring entity is either the records creator, an agent of the record’s creator, or a successor to the records’ creator.

Term	Definition
Transformation	The process or the results of a process, of reformatting or otherwise changing the way an electronic record is digitally encoded in order to reduce or eliminate dependencies on specific hardware or software, while preserving authenticity.
Unscheduled Records	Federal records which are not covered by a disposition agreement. Note: For the purposes of this RD, in the cases of transfer of unscheduled records, NARA may act in the role of transferring entity and create a disposition agreement for the transferred records.
Version	A copy that differs from the original in content, structure, or presentation.
Withdraw Record	To deny public access to records on the basis of an informed decision rather than in response to a formal access request. These informed decisions may be based on knowledge or assumption that the content of the record is exempt from release based on the FOIA, subject to restrictions placed on Congressional records, sealed court documents, or subject to prohibitions under deeds of gift, or is subject to other restrictions.
Withhold Record	To deny public access to records on the basis of a formal review and pursuant to the provisions of some controlling authority, such as the Freedom of Information Act.
Workbench	A set of end-user tools related to performance of a common role or job in the system. Each role/job has its own workbench that differs from another role/job workbench. The tools themselves are provided by a central authority and controlled under configuration management.

Appendix B: Requirements Tables

Availability is the ratio of time that a service is available to the total time of system operation. As availability is a statistical calculation, mean times are used. Availability takes into account Mean Time to Repair (MTTR) and Mean Time to Failure rates (MTTF). $\text{Availability} = \text{MTTF} / (\text{MTTF} + \text{MTTR})$.

Table B-1, ERA Availability Requirements, imposes graduated availability requirements on the specified ERA services and functional features.

ERA Service or Feature	Average Total Loss of Service per Year in Hours (FYI)	Availability
Access System via Electronic Interface	1	99.99%
System Request Acknowledgement - { Acknowledge request has been received even if service is not available at the time }	1	99.99%
Search Assets	6	99.93%
Access Assets	12	99.86%
User Communications	12	99.86%
Ingest - Human Aided Submission	12	99.86%
Media Distribution	40	99.54%
Ingest - Automated Submission	48	99.45%
Support Functions - {Redaction; Description of Assets; Perform Access Review; Coordinate Templates; Coordinate Dispositions; User Registration }	48	99.45%

Table B-1: ERA Availability Requirements

Table B-2, ERA Record Volume Requirements, provides requirements concerning transfer to ERA, accumulated archive volumes, and concurrent number of users for the ERA system over time.

	2007	2008	2009	2010	2011	2012	2013	2014
Avg. Yearly Transfer Volume (PB)	3.58	1.90	2.29	2.87	3.49	4.83	6.89	9.98
- Electronic	2.68	1.50	1.87	2.40	2.98	4.18	6.03	8.80
- Physical Media	0.89	0.40	0.42	0.46	0.51	0.65	0.86	1.18
Avg. Yearly Distribution Volume (PB)	1.79	2.39	3.02	3.74	4.56	5.71	7.34	9.69
- Electronic	1.43	1.97	2.55	3.22	3.98	5.03	6.52	8.67
- Physical media	0.36	0.42	0.47	0.52	0.58	0.67	0.82	1.03
Accumulated Holdings Volume (PB)	3.58	5.48	7.77	10.64	14.12	18.95	25.85	35.82
Avg. Num. of Concurrent Users*	40	80	101	127	158	199	259	344

	2015	2016	2017	2018	2019	2020	2021	2022
Avg. Yearly Transfer Volume (PB)	14.18	19.77	26.23	34.63	44.28	54.95	57.73	59.15
- Electronic	12.58	17.60	23.44	31.01	39.73	49.37	51.92	53.23
- Physical Media	1.61	2.16	2.80	3.62	4.55	5.58	5.81	5.92
Avg. Yearly Distribution Volume (PB)	13.00	17.56	23.53	31.33	41.23	53.43	66.10	78.97
- Electronic	11.68	15.83	21.26	28.37	37.39	48.50	60.05	71.79
- Physical media	1.32	1.73	2.27	2.96	3.84	4.93	6.05	7.18
Accumulated Holdings Volume (PB)	50.01	69.78	96.01	130.64	174.91	229.87	287.60	346.75
Avg. Num. of Concurrent Users	463	627	843	1125	1482	1922	2380	2846

Table B-2: ERA Record Volume Requirements

** Concurrent users are defined as the number of active sessions where archival system services are being exercised. These services include but are not limited to obtaining records, record queries, status checks, and logins and authorizations. The average number of concurrent users is the sum of all user activity across all instances of ERA.*

Table B-3, ERA System Performance Requirements, lists requirements for peak system load capacity and system response requirements for specific operations in seconds. Peak loads are a function of the number of average concurrent users supported as defined in **Table B-2**. Peak loads across all functional categories are cumulative (i.e., they are measured concurrently). Response Times are measured under nominal physical and electronic distribution loads.

Category	Peak Number of Requests to be Supported	Specific Operation	Response Time*
Log-on and authorization	1/3 of the total number of supported concurrent users	Account confirmation and authorization	5 sec
Search	8 times the total number of supported concurrent users	Single attribute search within descriptions	4 sec
	5 times the total number of supported concurrent users	Multiple attribute search within descriptions	7 sec
	2 times the total number of supported concurrent users	Advanced (e.g., concept based and proximity) search methods within descriptions	30 sec
Media Distribution	1/10 of the total number of supported concurrent users	Order submission and confirmation	15 sec
Status Check (account or request)	3 times the total number of supported concurrent users	Status of pending record order, subscriptions status, or account review	10 sec

* From initiation of query to start of display, exclusive of user environment and network delay. System is assumed to contain 1,500,000 records and associated descriptions.

Table B-3: ERA System Performance Requirements